

AMERICAN VETERINARY REVIEW.

NOVEMBER, 1909.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, September 15, 1909.

CONGRESS OF THE HAGUE.—As I am about preparing this chronicle, a great meeting is in full session in Holland, the Ninth International Veterinary Congress, where hundreds of veterinarians from almost every part of the world are in attendance.

The preparations for this great event have been carefully arranged, the work distributed with the greatest selection, and for those who know the well-deserved reputation of hospitality from the Netherlands people; there can be no doubt that the last general program, issued but a few days ago, will permit all the members and the many ladies who will accompany them to have, as we say in America, "a grand and splendid time." Of course a little dark cloud had made its appearance a short time since. Cholera was in Rotterdam! Cholera was in Holland! "Do not mind it," said the ever busy and kind general secretary, Prof. Doctor D. A. de Jong. And at once a notice, printed in the three official languages of the Congress, is mailed to every member, and indeed no one has minded it, I am sure! Anyhow I know that the American confrères who were to attend were not afraid of the Virgule bacillus, and that they were present to represent the profession of their country as she deserves to be.

I have received already a large number of the reports which the many reporters were to present and discuss. Unfortunately the program has given us the names of quite a number who have not kept to their word and whose report has not been handed in in time. Indeed said Prof. de Jong, "to treat the 32 questions

which the Congress intended to have treated, 145 reporters had been invited and only 11 had answered to their request." The task of this selection must have been quite difficult and much credit has to be given to the Committee of Organization for its success.

To get a fair idea of the importance of this gathering, to which his Excellency the Secretary of State had interested himself in having sent to the various governments invitations to have official delegations appointed, it was announced that 35 foreign governments had sent 110 official delegates and that this number was increased to 257 in counting those that had come from universities, schools or societies.

In relation to this statistic I may relate, for the benefit of our younger generations, another which shows the progress made in the success of these professional reunions. Organized by Prof. John Gamgee, the first International Veterinary Congress was held in Hamburg in 1863; it registered 101 members. The second at Vienna in 1865 counted 168, the third at Zurich in 1867 had 188, the fourth at Bruxelles in 1883 brought together 310. At the fifth in Paris in 1889 there were present 635 members. At the sixth in Bern in 1895 there were 670. At Baden Baden, the seventh, in 1899, counted 958. In 1905 at Budapest the thousand was passed, 1,400 members answered the roll, and in the ninth to-day at The Hague there are 1,448 members. And it is said that rolling stones gather no moss!

But time and space are pressing me and I must postpone further remarks until I am better documented. I will therefore pass for the present on the official opening, on the presentation and reception of the delegates, etc., etc., and on another occasion I will relate the results of the work done and what the veterinary profession can expect from this week of labor and festivities.

However, as our confrère, Prof. W. L. Williams, of Cornell University, is at The Hague, and as he has kindly accepted to write specially for the REVIEW a résumé of his impressions of the Congress, I am glad to give him in this chronicle the place he needs.

After what has most likely been said in these pages of the great veterinary meeting at Chicago in the October issue, these successive records of two such professional meetings will prove interesting. I wonder if the REVIEW will have space to also record that other important event, the Thirteenth Annual Meeting of the Inter-State Association of Live Stock Sanitary Boards, whose program I have read and which promised such valuable professional entertainment.

But we must not expect too much. Let us first read Prof. Williams' congressional impressions, as he has thrown them almost while on board of the steamer that takes him home.

* * *

The Ninth International Veterinary Congress has come and gone. Many important papers were presented and discussed which will, to some extent be reviewed or printed entire in these columns in future issues as room or interest may dictate. We are chiefly concerned at this moment with personal impressions and thoughts largely or wholly apart from the official reports of the Congress.

The Congress had three official languages, English, French and German. The location of the Congress at The Hague and the fact that the veterinary literature of Germany, Austro-Hungary, Switzerland, Holland and largely Denmark is in the German language, naturally caused this tongue to predominate, followed by French and lastly by English. America was represented by but six members, so far as we learned, including Drs. Van Es, of North Dakota; Frothingham, of Harvard University; Austin Peters, of Boston; L. M. Steckel, of Cincinnati, O., and the writer. The representation from Great Britain was not large but good. The total of English papers, including those from the United States, was conspicuously small.

Naturally those unacquainted with German and French could not profitably follow the discussions, nor could such enter into friendly intercourse with German or French-speaking veterinarians, unless the latter could speak English. Fortunately a

large proportion of European veterinarians speak two or more languages, in marked contrast to most veterinarians of English-speaking countries. Many of the members spoke well in various languages. For example, Prof. Bang, of Denmark, under the rules of the Congress, could not use his own language. Accordingly he presented his address in German and followed with a résumé in French and then in English. When we recognize the fact that the German and French languages are infinitely richer in veterinary literature than is our own, we should realize the enormous value of at least a reading knowledge of these two languages for all veterinarians. Americans are wont to say that the good French and German literature is translated into English, but this is only in small part true. Most of the literature remains untranslated. Most of our so-called English veterinary literature is from German or French sources. Some of it is accredited to the authors, some is not and little of it is adequately translated. At an international Congress, a knowledge of French and German are both naturally of very great importance.

* * *

As in other veterinary meetings, so in the International Congress, one of the most valuable results to those attending is the personal friendships and acquaintances formed with leaders of veterinary thought.

Aside from the command of languages, regardless of one's ability to converse with European veterinarians, there was still a valuable inspiration to be drawn from the meeting, which made attendance quite worth while. An American may stay at home and read imperfect extracts or translation from the writings of world authorities, but it is quite a different matter to grasp them by the hand and exchange personal greetings even under serious limitations of languages.

It is an inspiration to watch such men as Arloing, Ostertag, Dammann, Bang, Hutyra, Perroncito and many others, while addressing a congress, even though one grasps not a word.

There is some thing in the very bearing of the men which carries with their words a sense of authority. This feeling is greatly intensified if one like the writer has previously seen some of these men at work in their laboratories and knows with what accuracy and care their investigations about which they are speaking have been made. A very impressive element in the Congress was the courtesy shown by the Holland government. His Majesty Prince Henry, Consort to Queen Wilhelmina, opened the Congress and personally presided throughout the first meeting. And he did not appear bored by spending half a day in a veterinary congress. In America, when we succeed in getting an alderman or other ward politician to open a veterinary meeting, he tells us "we are welcome," tells a story he regards as funny, grabs his hat and runs.

In the evening following the opening of the Congress, Prince Henry gave a reception at the Royal Palace, to which all delegates to the Congress were invited, including Dr. Van Es and the writer, from the United States. At the close of the President's banquet a cordial message of good wishes from Queen Wilhelmina was presented.

The Minister of Agriculture of Holland attended the opening meeting and gave an address. He also attended the government reception to members of the Congress, the President's banquet and presided at the general banquet of the Congress. The Minister of State attended the general banquet and gave an address.

How marked the contrast with the attitude of high and low government officials toward the veterinary profession in America! In the banquet halls, we noted on the breasts of such men as Arloing, Bang, Hutyra, Ostertag and others conspicuous decorations from Presidents, Kings and Emperors, honors richly earned.

Democratic Americans may criticise these unfavorably; but it would be at least well for us if we had more such men among us and that our government recognized their work in some fitting manner.



These observations inevitably lead one to think of the veterinary schools of Europe and their relation to the state. The little State of Belgium thinks it worth while to expend more money for the equipment of a veterinary college than has been expended on all colleges in America together by state and private owners. Belgium is not an exception, but merely an example. In continental Europe veterinarians are educated by the state for the well-being of the state, in harmony with the needs of the state. When a student creditably completes his course, an honorable position in college, laboratory, army or elsewhere awaits him. The veterinary profession is an honorable profession, it is an honored profession, it is a scientific profession. The state schools consequently draw their students largely from the upper classes, socially and educationally, and the result is a profession, the members of which average very high in scholarship and manhood.

After one has visited a number of the representative veterinary schools in continental Europe, has met the members of the faculties of these colleges and seen them in their work and then observed the same men in the International Congress, he is strongly impressed with the value of veterinary education by the state. Are European schools perfect? Oh, no! They do not pretend to be. But seeing these schools, meeting their teachers, awakens many thoughts in the mind of one American at least and causes him to return to his native land, land of liberty, with a higher appreciation of European veterinary education and educators; as well as of some of the difficulties which veterinary education and practice must yet overcome in America.

* * *

A NEW METHOD TO FIGHT TUBERCULOSIS.—The struggle against tuberculosis of animals and specially that of bovines, will remain for some time to come the great sanitary question, and it is rare to open a veterinary or sanitary paper without finding some article relating to it, from scientists writing on the ques-

tion and suggesting new methods, which seem to them the one to realize the great object in view. And why not, when one takes into consideration the many attempts that have been recognized and the different results obtained so far. It is the important question of all cattle breeding countries and every one is interested in the solution of the problem.

Already in 1884 Dr. Lydtin, of Baden Baden, demanded that severe applications be established against bovine tuberculosis. The following year Prof. Bang inaugurated an anti-tuberculous war, based on the use of tuberculin, allowing the isolation of the animals that reacted from those that did not, and the raising of calves in keeping them away from any contaminated stock. Encouraging results have been obtained by this method in Denmark, Sweden, Norway and Hungary. In 1900 Prof. Ostertag recommended another method. This consists in isolating the calves from the second day of their birth, feeding them with cooked milk and preventing contamination. Older calves are submitted to tuberculin tests and isolated, if required. At the same time, sanitary veterinarians examine all the adults, those that are clinically tuberculous and dangerous, in other words, affected with open pulmonary intestinal, uterine or mammary tuberculosis are destroyed. In France, the struggle against tuberculosis has for base the indemnity paid by the state after declaration from the owner and the application of sanitary measures. Animals clinically tuberculous are destroyed and an indemnity is paid. Contaminated animals or those that have no clinical symptoms are watched by the sanitary veterinarians. The use of tuberculin is not obligatory.

In Belgium, the sanitary measures against tuberculosis are somewhat similar to those used in France, but they are better arranged and more complete.

The practical results are known. The methods of Bang and of Ostertag have rendered real services. And to a great extent they can be considered actually as the only two prophylactic measures from which comparatively lasting happy results can be

expected. For the methods of vaccination, says Ostertag, referring to that of Behring, the numerous experiments of control made by Rossignol and Vallee in France, of Hutyra at Budapest, of Eber at Leipzig, have demonstrated that, at the present hour, there is no practical use to undertake an efficacious fight against tuberculosis with them.

* * *

It is justly in the presence of this state of affairs and to remedy it that Prof. Lignieres, the learned director of the National Bacteriologic Institute, of Buenos Ayres, has proposed a new method which he has exposed lengthily in a communication made to the Société Centrale with the following conclusions:

1. Notwithstanding the efforts made since 1890, the results obtained are insignificant in relation to the sacrifices imposed.
2. The methods of Bang and Ostertag have rendered important services, but for many reasons they cannot give satisfaction. As to the method by indemnity it is more injurious than useful.
3. The diversity of the methods shows that the good one is yet to be found, as indeed it seems that it ought to be the same for all countries.
4. To be accepted, efficacious, to be imposed and become generalized the method must interest breeders without disturbing the economic running of an establishment.
5. The great factor of the dissemination of tuberculosis is the commercial mobility of diseased animals. Stopping them will mean immobilization of the centers of infection and also their possible destruction. Therefore all tuberculous subjects must be easily recognized by buyers and the sale of such animals must be cancelled *de facto* or by law in all cases.
6. Marking and obligatory rhedhibition are the two great means to control and fight against tuberculosis, because they will immobilize with certainty the diseased subjects. This method can be applied in all countries, whatever may be the sanitary system existing.

7. Either after a declaration, by an act in resiliation of sale, or because of the presence of tuberculosis detected at the slaughter house or in a rendering place, at a fair, market, agricultural show, or any other, the sanitary authority shall visit the establishment from where the animal affected or suspected comes from, and all the animals shall be examined and tested by the method of tuberculination known as that of "Associated Reaction," ophthalmic, local subcutaneous and dermo reactions.

8. Every animal that shall have positively reacted or presented clinical signs of disease, shall be marked with one or two holes pierced through the cartilage of each ear, and each one will have printed on the inside of the cartilage the date of the operation in one and the place of the operation in the other.

9. If no animal is found with clinical signs of tuberculosis, the establishment shall not be placed under quarantine, but the animals marked cannot be sold, except to the butcher. The sanitary veterinarian shall inform the owner of all the measures of isolation that must be taken, and will renew at least twice a year the tuberculination by the associated method and also notice the clinical condition of the sick ones. The sanitary inspection shall cease as soon as there will be no more *marked* animals in the place.

10. When, on the contrary, animals will be found with clinical signs of tuberculosis, these shall be isolated, put by themselves and the establishment be put into quarantine with all its consequences. Slaughter with indemnity of only part of the value of the animals shall be granted only for cows affected with tuberculous mammitis.

11. Accessory measures concerning the exploitation of milk, etc., can be taken according to the custom of the country, etc.

12. No effort shall be spared to the effect that the marking and the resiliation of the sale be accepted by all governments, in one word, to make these measures *international*.

* * *

TO PROVIDE GOOD MILK FROM DAIRIES.—In the meanwhile, a double method is resorted to in some parts of Belgium, and Prof. J. F. Heymans has presented before the Royal Academy of Belgium a communication on the anti-tuberculous tuberculination and vaccination of milch cows in the dairies of Gand.

The results were obtained in 18 establishments where cattle have been tuberculinized and vaccinated every year since three years, first in 1907, second 1908, and third 1909. While in 1907 neither of these places were free from positive reacting subjects, in 1908 in three of them and in 1905 in five, no positive reactions were given. Out of a total of 175—188 animals, the number of cows with negative reaction was raised from 89 in 1907 to 116 in 1908 and to 132 in 1909, or of 47 per cent. in 1907 to 63 per cent. in 1908 and 75 per cent. in 1909.

On the other hand, the number of animals with positive reaction was lowered from 84 in 1907, to 58 in 1908 and 37 in 1909, or of 45 per cent. in 1907, to 32 per cent. in 1908 and to 20 per cent. in 1909.

Taking off from the animals with negative results in 1909, those that did react before, there remains 110 non-tuberculous animals or 63 per cent., while in 1907 there were only 89 non-tuberculous animals or 47 per cent. The number of those non-tuberculous animals has then increased of 16 per cent. out of the 47 per cent. or more than one-third, and that of the tuberculous animals has diminished of 11 per cent. out of 45 per cent., nearly one-quarter.

This undoubtful progress is not due to prophylaxy only, as at the third tuberculination in 1909, the new animals of 1909 have reacted in the proportion of 23 per cent., while the new animals with negative results in 1908 reacted only in the proportion of 14 per cent., and those of 1907 and 1909 only in the proportion of 6 per cent. Besides this, the animals with positive reaction in 1907 have ceased to react in the proportion of 50 per cent. In other words, animals only vaccinated become infected in limits of 6 per cent., while new ones non-vaccinated are already tuber-

culous in the proportion of 23 per cent.; vaccinated tuberculous animals improve in the proportion of 50 per cent. Therefore, let us continue the application of tuberculination and vaccination, says Prof. Heymans in the dairies, and we will practically extirpate bovine tuberculosis and consequently provide milk without bovine bacilli.

* * *

LUXATION OF THE PERFORATUS TENDON.—Luxations of tendons passing over bony surfaces are not very frequent, and among them only a few cases have been recorded of that of the perforatus as it slides over the os calcis. The first relation of these accidents was that of Trelat published in 1865 and then followed by a few more recorded afterwards by Burch, Drouet, Goubaux, etc., among the French writers; Stockfeltt, Moller, Bayer, Reinecke, etc., among the Germans. The pathology is simple: one of the fibrous aponeurotic bands which holds, on each side, the cap formed by the tendon as it slides over the point of the os calcis, gives away and the tendon not held any more, slides either outwards or inwards more or less completely. The luxation outwards is said to be more frequent than that inwards. But no matter what cause had produced it and although a diagnosis is easily made out, the prognosis is almost always serious, unless the luxation is only partial. But if the lesions are more serious, the tendon being displaced, unless the animal is of great value, it is often better to have him destroyed, as at best the final result will be a permanent indurated swelling of the hock joint, of various size, formation of exostosis and so forth, which will more or less interfere with the work of the animal. It is to be regretted that such accidents, comparatively simple, should terminate that way because of the difficulty of a good treatment. Some of the classical works advise none. Only **contentive, in** movable dressings are recommended by others. Then the sutures of the fibrous bands to the surrounding parts after reduction of the luxation, free counter-irritants, blisters, and firing, all that have been tried and, comparatively speaking, no good results obtained.

In the *Journal de Zootechnie*, however, Mr. Péicus, an army veterinarian, already well known by his many contributions, has published an article headed: "A Practical Surgical Treatment of the Luxation of the Perforatus Tendon," in which he describes a simple operation which has given him a perfect recovery and which deserves attention. The case is this:

A mare had a complete outward luxation of the perforatus after a jump following a great gallop. The tendon is free on the outside of the hock, it can be easily replaced, but slips out again as soon as the mare lays down. After two weeks she has not improved, the dislocation can no longer be reduced, and being an army animal, the mare is to be sold. But before, Mr. Péicus "performed the aseptic and subcutaneous complete tenotomy of "the perforatus, just at the lower part of the hock, on the point "of junction of the portion of the tendon, that rested on the "outer part of the hock with that, where it is continued at the "back of the metatarsal bone, hoping that being promoted by the "repeated movements of the leg, the perforatus not being any "longer kept on the stretch, it would be able to resume its nat- "ural position and keep it." The wound was closed with suture and deep points of firing applied all round the joint. One month after the operation the mare could trot, although lame. Two weeks later she entered into convalescence and after a month her tendon was in such condition and solid that she could gallop as well as ever, and having almost no blemish.

This operation is so simple and so free from danger that if it gives as good results as Mr. Péicus relates, the prognosis of that injury will have lost a great deal of its bad nature. Let us hear from others.

* * *

HEMATOLOGY IN VETERINARY MEDICINE.—The study of the blood has during the last few years made great progress in human medicine. To-day the enumeration of the leucocytes and of the hematies is no longer the only satisfactory part of investi-

gation. Among the many corpuscles, several cellular species are recognized; ferments, immunizing substances, agglutinating, etc., etc., are looked for on account of the important part that they play in the history and diagnosis of some affections.

In veterinary medicine, researches are yet in their infancy, and for that reason anything relating to it is of interest. Mr. Cozette in the *Revue de Pathologie Comparee* has related a concise analysis of what has been published so far in veterinary medicine. He has given the enumeration of the leucocytes made with the hematometer of Hayem-Nachet and finally presented the pathological leucocytar variations that he has observed. These variations consist either in the diminution or the increase of the elements.

The diminution is observed in pneumonia, and in infectious diseases it is on the eosinophiles.

The increase is considerable in leukemia, and anemia of domestic animals. It may occur in the mononuclears (*mononucleosis*), in the polynuclears (*polynucleosis*), or in the eosinophiles (*cosinophilys*).

Its presence allows one to judge of the development of the disease and gives indications of a more delicate sensibility than those furnished by the thermometer, if it is accompanied with the proportion in the different varieties of leucocytes. It is observed in *pneumonia*, in *strangles* and in *suppurations* (abscess, arthritis, lymphangitis, etc.).

1. *Pneumonia of Horse*.—It is the disease where can be most easily followed all the modifications of the leucocytar equilibrium. From the apparition of the rusty nasal discharge leucocytosis appears with 15 to 20,000 white corpuscles, then the number gradually runs down, to remain above the normal during the entire disease. The leucocytosis follows the condition of the temperature: if this drops quick, the dropping of the leucocytosis is equally rapid.

Relapse is indicated by an increase of the leucocytosis. More serious is the disease, more accused is the leucocytosis. During

the disease a great increase of neutrophile polynuclears are also observed (83 to 90 per cent.) with a corresponding reduction of the large and small mononuclears and of the eosinophiles. Then when *recovery* is getting certain, there is a diminution of the polynuclears and a proportional increase of the lymphocytes and mononuclears; finally at the time of convalescence eosinophiles reappear.

A prognosis of *death* can be given when the number of polynuclears goes beyond 90 to 92 per cent.

The formation of *purulent* or *gangrenous centers* in the lungs is indicated: (1) by the constant fever with chills and exacerbations; (2) by the persisting very high leucocytosis (18,600 to 24,800). The passage from acute pneumonia to the chronic stage is indicated by a continuous leucocytosis, gradually increasing with noticeable predominance of polynuclears.

2. *Infectious pneumonia*—*Polynuclear leucocytosis* is so much more marked that the phlegmasia is more severe.

3. *Pleurisy*.—Leucocytes 19,880, polynuclears 90, mononuclears 10, eosinophiles 9.

4. *Strangles*. *Great leucocytosis* with *polynucleosis* and disappearance of eosinophiles. The hyperleucocytosis progresses with the abcedation, and until complete maturation of the abscess. When leucocytic exacerbations occur, complications of the disease can be expected.

To resume.—1. The higher the hyperleucocytosis, the more serious is the prognosis.

2. The more the leucocytic proportion gets away from the normal the more serious is the prognosis.

3. The raising in the number of the polynuclears and the complete disappearance of the eosinophiles constitute a most particularly bad prognosis.

BIBLIOGRAPHY—**EQUINE ANEMIA**.—Under that title Winfred B. Mack, D. V. M., attached to the staff of the University of Nevada as Veterinarian and Bacteriologist has published the account of a recent inquiry into the nature and cause of an ob-

scure and fatal disease among the horses of the eastern part of the State of Nevada.

This pamphlet which contains the minute records of the history of the disease, its geographical distribution, the records, treatment and post mortem of several clinical observations, with the pathogeny, histology, blood and urine examinations, etc., and with a good comparison of diseases which in other countries have presented some similar features, will form a valuable addition to the literature of those peculiar affections to which the attention of veterinarians has been called only in the few last years. The summary of the conclusions arrived at by Dr. Mack is concise but interesting.

1. There exists in Eastern Nevada a disease among horses probably identical with the infectious anemia of Europe. It may also prove to be identical with the swamp fever of Manitoba and the middle Western States, referred to by several Canadian and American writers, when that disease shall be fully described.
2. The disease is characterized clinically by profound cardiac and respiratory disturbances, an irregularly remittent fever, rapid emaciation, marked loss of nervous and muscular energy, progressive anemia, oedema and in the last stages by capillary hemorrhages.
3. The primary lesion appears to consist of a progressive destruction of the red blood corpuscles, followed secondarily by parenchymatous degeneration of the kidneys and liver and sometimes of the cardiac muscle, and by extensive changes in the vascular system. Toward the end of the course of the disease extensive capillary hemorrhages occur, especially in the heart, the gastro-intestinal tract, and the kidneys and usually in the other visceral organs, beneath the serous coats and into the sub-cutaneous and intermuscular connective tissues. The spleen is engorged and sometimes degenerated. The bone marrow undergoes profound alteration.
4. The symptoms and lesions encountered appear sufficient to constitute a distinct clinical and pathological entity.

5. Experiments apparently indicate the infectious character of the disease; that the virus exists in the blood; that the infectious agent is not revealed by the usual methods employed to demonstrate the presence of bacteria or protozoa; and that the disease is not contagious by the ordinary contact of animals.
6. The natural mode of dissemination yet awaits demonstration.
7. The mortality exceeds 90 per cent. with recovery more apparent than real.
8. Treatment has not been successful to any extent.

* * *

ACKNOWLEDGED PAMPHLETS AND COMMUNICATIONS.—*The Report of Chief Veterinary Surgeon J. D. Bostwick*, giving the sanitary condition of stock in the Transval Districts.

Problem of Bovine Tuberculosis Control, by Dr. M. H. Reynolds.

Abstracts from the Laboratory of Veterinary Physiology and Pharmacology under the direction of Prof. P. A. Fish, with reports on Experiments with Pilocarpine Hydrochloride by L. V. Polk, on Milk Secretion and Diseases Transmitted by Milk, by Prof. Fish; on Phytolacca Decandra, by Roger D. Hyde.

The Agricultural Journal of the Cape of Good Hope, with article on hernia, by W. Robertson, M.R.C.V.S.

Bulletins of the Bureau of Animal Industry.—Circular 147: The origin of the recent outbreak of foot and mouth disease in the United States, by J. R. Mohler, V.M.D., and Milton J. Rosenau, M.D.

Circular 113.—On filtration experiments with bacillus cholera suis, by Dr. C. N. McBryde.

Circular 150.—Regulations governing entrance to the veterinary inspection examination.

Circular 138.—Infectious Anemia or Swamp Fever of horses, by John R. Mohler, V.M.D.

A. L.

SOCIAL ASPECT AT THE HAGUE.

Through the courtesy of Dr. L. M. Steckel, who had been abroad since December, 1908, during which time, in addition to pursuing studies at the Imperial Veterinary College at Berlin, Germany, he has made a tour of the principal cities of Germany, Austria and France, with the object of acquainting himself with their veterinary hygienic systems, visiting the stock yards, abattoirs, dairy and food establishments, market halls and hygienic laboratories, finally arriving in Holland in time to attend the congress at THE HAGUE, we are enabled to present, as an accompaniment to Prof. Liautard's chronicles in this number, a picture of a group taken on the terrace of the Hotel Kursaal, with the North Sea in the background. In the center of the group, in the front row, seated at a table, is the president of the organization, Prof. W. C. Schimmel, with Mrs. Schimmel on his left and Secretary D. A. de Jong on his right. On the left side of the picture, in about the fourth row, is seated a representative American veterinarian, in the person of Dr. Van Es. We were not able to learn whether any of our other American veterinarians were in this group, except Dr. Steckel, who from modesty, chose a position at the back, where he may be seen standing on the left side of the group, wearing a hat. The ladies in the picture are the wives and friends of the delegates.

Dr. Steckel had called at the REVIEW office before sailing for Europe, so that on his return, we were naturally anxious to have him relate some of his experiences abroad; which proved so interesting that we endeavored to urge him to write an account of his trip for publication. This, however, we were unable to do; beyond a meagre promise that he *might* at some future time.

We therefore determined to present our readers with a few facts relative to the social aspect at THE HAGUE as gathered from conversation with Dr. Steckel during his call.

A special reception to the members of the congress was given by Her Majesty the Queen of Holland and His Highness Prince Henry of the Netherlands.

The first delegate from each country were tendered a dinner by the Secretary of Agriculture, where many dignitaries, from the state and the diplomatic circles, were present.

A gala performance in honor of the congressionists took place at the Royal Theatre, which was a very notable event. In addition, there were many social affairs given by various societies, to which the members of the congress were welcomed, free. In fact, the reception and welcome given by the city and the people, to the veterinarians and others in attendance at the congress, were as cordial as that given to members of a peace congress. Everyone was made to feel at home and glad they had come.

THROUGH a printer's mistake, in the index to volume XXXV, which was attached to the September, 1909, number of the REVIEW, the table of contents was headed volume XXXIV. We desire to call all REVIEW readers' attention to that fact, and to urge them to correct it *at once*, so as to read volume XXXV; because if they do not do so, the binder may mark the back of their volume incorrectly when they have been bound. It is a simple thing to do. Do not neglect it and you will be saved much annoyance. Heading now reads, volume XXXIV, *should read* volume XXXV, the same as on the title page and heading to list of illustrations.

HORSES IN LITERATURE.—In sacred writ it was deemed worthy of record that Solomon imported horses from Egypt, while the description of the war steed in Job is accounted one of the finest parts of that finest piece of literature. In Greek myth and English satire the qualities ascribed to Centaur and Houyhnhnm testify sufficiently to the high regard in which the horse has ever been held. The name of Bucephalus is inseparably coupled with that of Alexander. At least one Roman emperor had divine honors paid his charger. Who can picture Don Quixote sleeping on his armor without seeing the princely Rozinante tethered under the dewy night? And the stirring incidents of John Gilpin's ride conclusively proved that the racing blood of far-removed equine ancestors was not entirely wanting in the degenerate descendant.—*Washington Post*.

ORIGINAL ARTICLES.

RELATION OF MILK TO THE PUBLIC HEALTH.*

By W. A. EVANS, M. S., M. D.

Milk is not only a valuable and widely used food, but it is a quasi necessity. While not as necessary as air and water, with some people, for example, bottle-fed babies, it is almost as necessary, and with the majority of people it borders on the necessary.

A congested population demands that everything which is taken into the body of man be heated to a germ-killing temperature or that great effort be made to preserve its purity or to purify it.

Chicago breathes an impure, uncooked air and pays for it with 9,000 deaths a year called deaths from pneumonia, consumption, influenza and bronchitis. Chicago has spent fifty million dollars for pure, uncooked water, and, having paid the price, her typhoid death rate is exceedingly low.

This leaves milk, ice, oysters, some fruit and some vegetables as the only other foods which are eaten raw. Fruits and vegetables are usually peeled or washed before they are eaten raw. Bacteria in ice frequently do not survive. Raw oysters are not in widespread use. This leaves milk and its products as the one great and important food which, with us, is badly infected and is eaten raw—air having been left for separate consideration.

Germ-free mother's milk given by a well-nourished, healthy, quiet, calm mother who is naturally a good milker as to quantity and quality is more nearly a complete food than any other where the person taking the food is less than one year old. Such milk is not bulky enough and in consequence it leads to consti-

* Presented at the joint session of the American Veterinary Medical Association and the Chicago Medical Society, Chicago, evening of September 8, 1909.

pation as soon as the intestinal nerve endings lose some of their primal sensitiveness. It is deficient in iron. After one year of age the child requires some supplement. This conclusion would not apply if the mother was not healthy, or rested or contented, or for other reason was not a good milker. As milk departs from the above standard it becomes less a perfect food. Radical departure may mean a very harmful product.

Milk may be harmful in either an active or passive way; the first being where the overshadowing agent is a changed chemical substance, the second where the milk transports harmful substance, but of itself is not greatly changed. The first division is subdivided into two milk poisoning and milk intoxications. The first of these are tyrotoxicon and other ptomaine tox albumin and other tox albuminose poisonings. These poisons seldom change the taste, odor or appearance of the milk. They give no warning of their presence. Such poisonings are very dramatic and startling, but the number of people who die each year from them is very small. The milk intoxications are milder poisonings. Such are found among teething children. Of them are those cases when nothing containing milk agrees with a given child. Baby feeders are now agreed that babies, and especially sick babies, are fed too much milk. Fat, either as an excess of neutral fat or as fatty acids, is usually the offending agent. Such children do well not infrequently on buttermilk or on skimmed milk.

Milk overfeeding is probably the most frequent cause of diarrhoeas in babies. The remainder of the baby diarrhoeas which are due to food are due to bacteria in milk. Many of these are ordinary pus cocci, *e. g.*, streptococci. Others are due to various organisms. Such diarrhoeas are certainly responsible for 1,000 baby deaths in Chicago each year.

There is no question but that milk is now our second most important spreader of typhoid, and our most important spreader in those cases which contract the disease in the city limits. It is certainly an occasional means of spreading scarlet fever. Milk borne scarlet fever epidemics are usually characterized by a

sharp, flash-like onset. Less frequently milk spreads diphtheria and measles. It may spread smallpox.

How much tuberculosis does it spread? Koch says that the proof is conclusive as to lymph, gland, bone and abdominal tuberculosis—say $1/12$ of all tuberculosis. He says that no proof offered that pulmonary tuberculosis is due to bovine tubercle bacilli is satisfactory to him. He says the bacilli of the bovine type can occur in man. But $11/12$ of human tuberculosis is pulmonary, and preventive measures against tuberculosis should therefore be directed primarily against the human tubercle bacillus.

If you analyse Koch's position it is this:

1st. There are biological differences between human and bovine tubercle bacilli. Either one of these bacilli can be modified in any one of several peculiarities by changing its environment. But, says Koch, the possibility of these changes has no bearing on the question of the transmission of bovine tuberculosis to the human subject. May we not in fairness say that if the fixity of type has no bearing then the differences in type has no bearing, and if these propositions are true, then any argument based upon differences in type must be abandoned?

2d. Bovine tubercle bacilli have not been found, according to Koch's satisfaction, in pulmonary human lesions (the presence of bovine bacilli in other human lesions being conceded). To this the reply is that sputum practically always shows a mixed infection and in consequence observations on finer biologic peculiarities are difficult at best and liable at all times to error. The same rule as to mixed infections applies to pulmonary lesions as they come to autopsy.

If there are no satisfying proofs that bovine bacilli are the cause of pulmonary human tuberculosis, there are also no satisfying experiences that they do not cause it. The proof that tubercle bacilli considered generically cause human pulmonary tuberculosis is established. The burden of proving the bovine bacilli will not cause human pulmonary tuberculosis is on the negative side. To be more explicit, bovine bacilli, as a sub-

group of tubercle bacilli, stand logically accused; it is up to Koch to prove them innocent in human pulmonary tuberculosis.

In addition, the views of Von Behring and Von Harbitz as to the etiologic relation of glandular to pulmonary tuberculosis is entitled to weight. The more recent observations on the histology of tubercle and miliary generalization through the thoracic duct must be weighed as arguments against his view.

Note the general attitude of Koch is "show me," whereas there is no logic in any position for Koch except that of his making proof.

3d. Preventive measures against tuberculosis should therefore be directed primarily against human tubercle bacilli as $11/12$ of the human lesions are pulmonary and only $1/12$ abdominal and other. This hypothesis is founded upon a fixed difference in clinical type. Every man of large clinical experience knows that pulmonary tuberculosis ends by involvement of the intestines and other abdominal viscera, and abdominal tuberculosis often ends by pulmonary involvement. But even if we assume his position to be correct, let us do the best we can against the $11/12$, but let us not forget the poor $1/12$ who also sicken and die. Shall we not punish a man who has stolen a bucket of lard because another man has stolen a three-ring circus? Let us rather do our best against each of these.

But there is another side of this question important enough to stand entirely alone. Every one is agreed that bovine tuberculosis can be spread to cows and to hogs. Bovine tuberculosis is contagious to cows. It therefore threatens the milk and meat industry. It lowers the producing capacity of cows. It therefore in time impoverishes the farmer unless there is an increase in the price of milk and that increases the cost to the consumer. It infects hogs and it therefore raises the price of every pound of meat sold in the United States. It will spread to every other domestic animal which is now or may in future be kept under radically unnatural living conditions, *e. g.*, milk goats.

It is my judgment that the host modifies the clinical course

and the anatomical distribution of tubercular lesions more than the type of bacillus.

Founded on the above medical premises, the city of Chicago is enforcing certain ordinances. The underlying legal principle involved is that we have the right to prevent anything being sold to our people which can be reasonably proven to be harmful to them or immediately capable of becoming so. This control theoretically begins at the city limits or immediately adjacent thereto. However, here and there, there is a legal tendency to recognize a parallelism between milk and water in that the government is allowed to control the source, even though it be extra territorial, because of the great importance of the necessity and the almost impossibility of insuring its safety by any wholly intra-territorial measures.

The Chicago milk supply consists of 30,060 8-gallon cans a day. This is produced on 12,000 farms and by 120,000 cows. 1,800 of these cows are in the city limits. Of the remainder, ninety per cent. are within fifty miles of the city. Practically all of the milk is shipped in on the train (all but 1,000 cans). The great bulk of this milk is produced in Illinois, much of it is produced in Wisconsin, considerable in Indiana, a little in Michigan and very little in Iowa.

The methods for the control of milk are those usually in force in the larger American cities. We have the usual corps of farm inspectors, platform inspectors and town milk inspectors. Milk that is improperly produced we decline to allow to be sold in our market. The farmer can produce as he pleases or sell to any one else whom he pleases, but not to us. The records are all public. The dealer can get the record of the farmer of whom he is thinking of buying, the farmer can get the record of the dealer to whom he is thinking of selling.

Recognizing the very great difficulty in controlling cleanliness, unsanitary conditions and communicable diseases in farms and farm households removed many miles from the city; recognizing the widespread distribution of tuberculosis among cows and men, and the widespread distribution of typhoid among farm-

ers and farms, the Chicago City Council in July, 1908, passed an ordinance which became effective January 1, 1909. This ordinance provided that all cows supplying milk to Chicago must be free from tuberculosis by January 1, 1914; that the test of tuberculosis for the purposes of this ordinance shall be a reaction to the tuberculin test; that during this interval all milk not from cows proven to be free from tuberculosis shall be pasteurized according to the rules and regulations of the Health Department.

The principles involved in these ordinances are as follows: The average profitable milk cow does not remain profitable for five years. A farmer having his cows tested and finding some tubercular can segregate the tubercular cows, keep his hogs away from them, send the milk to a pasteurizer and keep the tubercular cows until they are no longer profitable, when they can be sent to inspected slaughtering establishments and sold for beef. By segregation I mean that the cows should be kept in a separate barn and should use a separate watering trough. A separate pasture is not necessary. This separation is wholly for the farmer's good. By allowing the farmer five years to get rid of his tubercular stock you save him money loss, in fact, you make money for him, and you therefore expect his co-operation.

But, you ask, is it safe for the people? Will pasteurization kill the harmful germ? The ordinances provide that the pasteurizing shall kill 99 per cent. of all the bacteria and all of those capable of producing disease. I now propose to tell you of how we have succeeded with these ordinances. Of Chicago's 30,060 8-gallon cans of milk, 18,000 are pasteurized, 7,000 are from tuberculin-tested cows, and 5,000 cans are not complying with the ordinance. The 7,000 cans of tuberculin-tested milk come from 30,000 tuberculosis-free cows. Nearly all of our milk supply from Indiana comes from cows which have been tuberculin tested; about one-third of that from Wisconsin is from tested cows; but little of that in Illinois is from tested cows.

The tuberculin testing has been a source of much fraud. Veterinarians have faked reports, and farmers have immunized their cows preparatory to the test. In Indiana the work was

done by the state, and it averaged very satisfactorily. In Wisconsin and in Illinois it is promiscuously done, and much incompetency and much fraud has been shown and some has been proven. The pasteurizing is done by 43 plants in town and 100 in the country. Some of the plants have done excellent work; some are faking, and some are incompetently run. Most of the faking is done by creameries and other butter plants.

The holding pasteurizers are almost uniformly good; the flash pasteurizers are sometimes good and sometimes not. A flash pasteurizer which heats to 168 to 180 and which does not have the cream line or give a cooked taste will do satisfactory work 75 per cent. of the time. A pasteurizer which affects the cream line at 160 to 168 will not do effective work because the operator will not run it at a high enough temperature. Our best results have come from 140 to 145 for twenty minutes. But expensive holding devices, while giving excellent results, hardly seem necessary. Milk run through a cheap pasteurizer at 150 and then run into ordinary cans will be 146 or over in twenty minutes. If then it is rapidly chilled the bacteria are killed, the cream line is good, and there is no cooked taste. An ordinary holding vat of sanitary construction and heated before the milk is run in will serve the same purpose. I cite you some figures on milk taken at the machine:

{ Raw	3,450,000 .
{ Pasteurized	33,000
{ Raw	4,400,000
{ Pasteurized, less than.....	2,000
{ Raw	30,700,000
{ Pasteurized, less than.....	2,000
{ Bottle	550,000
{ Raw	3,900,000
{ Pasteurized	20,000
{ Bottle	65,000
{ Raw	3,760,000
{ Pasteurized	20,000

{	Raw	3,390,000
	Pasteurized	20,000
	Bottle	80,000
{	Raw	6,700,000
	Pasteurized	94,000
	Bottle	150,000
{	Raw	9,300,000
	Cooler	178,000
{	Raw	18,250,000
	Cooler	30,000
	Bottle	28,000
	Bottle, second day.....	990,000
{	Raw	25,700,000
	Pasteurized	150,000
{	Raw	16,400,000
	Pasteurized, less than.....	2,000
{	Raw	4,350,000
	Pasteurized	53,000
{	Raw	6,400,000
	Pasteurized	28,000

Since January 1st we have taken 5,661 samples of milk and ice cream for bacteriologic examination. About 200 of these have been injected into guinea pigs, and the remainder have been examined, or are being examined, or have been lost.

Since July 1st we have taken 2,301. The great majority of these have been taken from stores, depots and wagons; a minority have been from hospitals, homes and other customers; many have been taken at the pasteurizing machine; 50 were ice creams.

The following is an analysis of 764 samples taken since the latter part of July: Pasteurized, 230; raw, 534; average number of bacteria in the raw milks to the c.c., 7,348,828; average

number of bacteria in the pasteurized milks per c.c., 941,445. The pasteurized samples are one-eighth as bad as the raw.

	Pasteurized.	Raw.
Under 1,000.....	2	0
1,000 to 10,000.....	7	0
10,000 to 100,000.....	86	12
100,000 to 500,000.....	68	50
500,000 to 1,000,000.....	26	39
1,000,000 to 5,000,000.....	29	217
5,000,000 to 10,000,000.....	4	103
10,000,000 to 20,000,000.....	7	79
20,000,000 and over.....	1	34

Using one million as the dividing point and saying that milk containing over one million germs to the c.c. should not be fed to babies, and that milk having under one million can be so fed, we get:

Pasteurized—1,890 samples under 1,000,000, 41 samples over 1,000,000.

Raw Milks—101 under 1,000,000, 433 over 1,000,000.

In ice creams the maximum count was 125,000,000; the average was over 20,000,000; eight had 30,000,000 and over. The minimum ice cream was 10,000; several were under 100,000, showing that it is possible to make good ice cream.

Not infrequently a milk which was good at the pasteurizer was spoiled by a dirty bottle, a dirty cap or dirty fingers in capping. The maximum number of bacteria found in a supposedly sterile bottle was 24,000. A count of 800 was not unusual.

All in all, we are sure that it easier to control pasteurizers than it is to control tuberculin testing, and certainly than to control 12,000 farms.

With us these ordinances are not only getting us better milk, but they are helping us to get the farms cleaned up. Sanitation, a bogey, a fad to the farmer, becomes something real when he sees an expensive plant for purifying milk. Its effect is just the same as the location of a large, up-to-date milk plant in a coun-

try neighborhood. Every farm in reach of such a plant gets cleaner year by year.

We are sure that in optional tuberculin testing and pasteurization, properly controlled, we have found the proper solution of this vexed milk question, a solution which in time will be found acceptable alike to farmer, dealer, consumer and health official.

OKOTOKS, Alberta, Oct. 15, 1909.—AMERICAN VETERINARY REVIEW, Gentlemen: Enclosed please find money order for \$3.25 for renewal to the A. V. REVIEW. I have been a subscriber for six years and would not be without this periodical, which I think is peer to them all in regard to advancing veterinary knowledge. Yours, truly, Percy K. Walters, V. S.

MARE SUCKLES CALF.—In the pasture of Mr. John Camplin, near North Salem, Ind., is a mare and her colt and a spring calf. The calf, not satisfied with the lacteal fluid supplied by the farmer, gets an extra portion by robbing the colt of its just share. The mare at first resisted the calf by kicking it, but later became reconciled, as the nervy calf became more insistent. The mare, colt and calf are now living in the pasture on the best of terms.—*Rider and Driver.*

THE PERFECT HORSE.—The Arabs of the Sahara sum up a perfect horse thus: "He must carry a full-grown man, his arms, and a change of clothing, food for his rider and himself, a flag, even on a windy day; and, if necessary, dragging a dead body behind him; he must keep up a good pace the whole day through without giving a thought to food or water." In their opinion, a horse lives from twenty to twenty-five years, a mare from twenty-five to thirty years. They consider a horse to be in his prime from the age of seven to fourteen years, as the following Arab proverb shows: "Seven years for my brother, seven years for myself, seven years for my enemy." They affirm that, with a mare, the best age for reproduction is from four to twelve years of age, and with a horse from six to fourteen. While they are exacting as regards the mare for breeding, they are still more so as concerns the horse.—*The Rider and Driver*, Sept. 25, 1909.

MILK, THE PRODUCER, THE CONSUMER, AND THE VETERINARIAN.*

BY M. H. REYNOLDS, UNIVERSITY OF MINNESOTA; AND LIVE-STOCK SANITARY BOARD, ST. PAUL, MINN.

The veterinarians of America are here in session for the promotion of their profession, and, through the promotion of the veterinary profession, protection of human health and the saving of human life. We are here for the promotion of agriculture, and, through the promotion of agriculture, the improvement of all civilization which rests fundamentally on agriculture.

We are here to-night for public service, the great aim of all our work, "for what is a man if his chief good and market of his time be but to sleep and feed." We believe, and I think we realize, that our profession has certain positive and special duties resting upon it in this sanitation work. Unquestionably our M. D. brethren realize just as clearly their responsibility—a joint responsibility.

Milk, the producer, the consumer, and the veterinary profession; or, more properly placed, milk, the producer, the veterinarian, and the consumer; placing the veterinarian between the producer and the consumer, where, indeed, he serves. How closely they are organized and related, and how close the interdependence! What a group!

Milk, the most important and most necessary single food article; the *producer*, whose business it is to supply this most important food article to millions of consumers, this man the producer, who is capable of so great good or such infinite harm; then there is the *veterinarian*, the professional man who stands as helper and defense for the producer, and the guardian of the consumer's foodstuffs, this protector of human life and protector

* Presented at the joint session of the A. V. M. A. and the Chicago Medical Society, Chicago, evening of September 8, 1909.

of the world's live-stock; and finally the *consumer*, millions, unknown millions of him.

Our study to-night has to do primarily with milk.

MILK.

Here is a liquid food, the sole food of young children at a time when they are most susceptible to infection and injury; the food that is most easily contaminated; and a food that is most dangerous when contaminated. One typhoid bacillus may lodge upon a piece of bread or meat. It is a typhoid bacillus. It may lodge in milk that is kept warm, and in twelve or eighteen hours may have multiplied into inconceivable numbers.

Many dirty foods may be cleaned when soiled, or at least may be sterilized without harm. Milk once dirty must remain dirty and cannot be even sterilized without injury. All this may be trite, but the situation fits to the story of the practical old minister who preached the same sermon ten Sundays in succession, and when remonstrated with by his parishioners, who thought it somewhat monotonous, replied that he had seen no signs that they had profited sufficiently as yet, and when they commenced to practice his teaching in this one sermon he would give them another.

The death rate of infants is a commonly accepted standard for measuring safety of milk and efficiency of inspection. Consider the significance of this statement. An intimate relation is universally conceded among medical men between intestinal diseases of children under two years of age and the milk supply. We all know that. We can say it easily, but let us take it home to-night and ponder upon it seriously.

Not only medical men, physicians and veterinarians, but all citizens have personal responsibility in a wise solution of the municipal milk problems, for while the adult may have a doubtful right to ignore a probable source of danger for himself, he cannot morally ignore a probable source of danger for children or other dependants, or even for other adults.

Does anyone doubt that a considerable portion of municipal milk is of doubtful cleanliness and safety at the time of consumption? Surely no veterinary inspector doubts who sees many city dairies and farm dairies, nor any physician who gets into the poorer kitchens. Not all city dairies are dirty; and many poor kitchens are scrupulously clean; but there are many dirty and unsafe dairies, and there is very much bad handling of milk in homes. Some dairies are clean and managed by good dairy methods and good business methods. There are others where the milk cows are covered with caked manure, where cows wade up to their udders through filthy barnyards; where milking is done into rusty and unclean pails, or where stable dust is abundant during milking.

Does anyone doubt that many milk cans are opened in dusty streets? Can anyone doubt that much milk is carted about city streets for hours in ten-gallon cans during warm weather or that many milkers wear dirty clothing?

I quote from a public address by Hon. John D. Nichols, president of the Ohio Dairymen's Association, at the Michigan Dairymen's convention:

"Your dairy inspectors know that there are hundreds of dairies in the State of Michigan kept in stables so dark that you can scarcely tell the color of the cows, let alone telling the different kinds of material that might drop into the pail. And what is true in Michigan is true in every state in the land."

Some folks may think Mr. Nichols' statement a modern Canterbury Tale, but it isn't.

Just to illustrate—and there are pages and pages of similar material easily available and reliable—let me call attention to an official examination of Washington City milk. There were 172 samples examined. Of these, 121 samples, or 70 per cent., showed visible dirt on standing, and the microscope showed that the visible dirt was partly manure. This manure may have been very rich in phosphoric acid and ammonia, and all that, but it was in the wrong place.

Workers in the federal Bureau of Animal Industry showed in the case of 24 cows taken from various Washington City dairies, that 10 were passing virulent tubercle bacilli in the manure. Six other old chronic cases of tuberculosis were also passing virulent tubercle bacilli. Is not this so significant that further statement on a disagreeable topic is quite unnecessary?

Washington City enacted a milk law in 1895. During the first year after enactment, infant mortality from intestinal diseases was 168 per 100,000 population; the second year it was 151; the third year, 136; the fourth year, 110. Subsequently this death rate was reduced to 97 in 1906. Very plainly there was something wrong with Washington City's milk—something that needed correction and something that was greatly improved.

This great improvement in the infant mortality rate following the enactment of the milk law must have resulted from very imperfect service, as evidenced by the call for a study of Washington's milk supply in 1907 by a special conference committee of eminent men. The urgent need for further improvement was clearly brought out in their report.*

A recent bulletin † by the Illinois Experiment Station reports 143 samples of milk taken from different points in Illinois. Of these, 68 per cent. gave visible sediment; 21 per cent. a large amount of sediment; 61 per cent. of them gave a bad odor on cheese curd test; and the curd test odor implies objectionable contamination.

It is probably true that dairymen are blamed for a great deal in connection with child mortality tables, for which they should not be blamed, especially in large city statistics taken from the poor tenement districts, but as a prominent dairyman, speaking to dairymen, said recently, "the dairyman cannot be justly blamed for all of these things, but the Lord knows he will have sins enough to answer for if only righteously accused."

Lest someone may think that this kind of talk is coming from veterinarians who are not practical dairymen, let me quote again

* Sanitary Milk Production. U. S. Dept. of Agri. Bureau of Animal Industry.—Circular 114. Issued August 20, 1907.
† Bulletin No. 120 Trueman.

from an article in *Hoard's Dairyman*, perhaps the most progressive and ablest edited dairy journal in the world.

"As a matter of fact, our milk has not been up to scratch; it has been dirty, and many times with the dirt have been the germs of disease. Our babies have suffered much." * * *. He refers freely to "dirt and germs from the dirty cow, utensils or hands of the milker."

This is from an article from A. B. Clark. Mr. Clark then goes on to show by itemizing that without very costly equipment or extravagant methods, great improvement may be made in milk at the point of production and done at moderate additional cost.

RELATION OF MILK TO DISEASE.

The Chicago Department of Health reported in October, 1908, investigations of typhoid outbreaks. One was at West Pullman. Fifty cases were on the route supplied by one dealer. Investigation on the farms supplying milk discovered typhoid fever in the family, two children being sick. It was later learned that the local dealer had known of this typhoid on the farm and among his patrons, and it is consoling to note a statement that revocation of his license followed promptly.

It is in just such cases as this where the physician and the veterinary inspector must co-operate, and the producer must come into the partnership for best results.

Further investigations in Chicago showed an interesting additional source of typhoid. This disease was found on another dairy farm which had been the source of a serious typhoid epidemic some months before. During this previous outbreak, 32 cases were traced to this farm and investigations developed deplorable sanitary conditions. Milk from this farm was excluded from the Chicago market to the credit of Dr. Evans, City Health Officer, here with us to-night.

Denver has reported 58 cases of typhoid fever from 69 families receiving milk from a dairy in which an attendant had a mild typhoid. This typhoid attendant milked his cows and cared

for a member of his family who also had typhoid fever. Incidentally, the alvine discharges were emptied into an open cesspool to which an enormous number of flies had free access. The suggestion is self-evident. When one thinks of these things, indeed "prudence and propriety and all the other pious p's do have to sit upon "the lid of speech."

When an epidemic is explosive in its onset; follows milk from a specific source; is confined to milk drinkers; when the disease is most frequent in houses where most milk is consumed, it is usually safe to conclude that milk served as a means of dissemination.

Good records* of at least 600 outbreaks of milk-borne typhoid are available, and a great many others where the evidence is not quite conclusive. Of 878 typhoid outbreaks collected and studied, 38.5 per cent. were evidently milk borne, and usually the fault of either the producer or the dealer. This same report gives in full detail 125 outbreaks of scarlet fever and 51 outbreaks of diphtheria clearly disseminated by city milk. There are plenty of such records available for anyone who cares to pursue the study. It is not a pleasant pastime but full of significance.

Listen to a few statements from a city department of health:

"The average bacterial count for the raw milk taken on the street was 8,164,152. The average for the pasteurized milk was 1,219,309" (500,000 is a fairly generous standard for good raw milk).

"The baby death rate of the last week furnishes no source of gratification. The total deaths under one year of age jumped from 142 of the preceding week to 194, an increase of 52."

"The gastro-intestinal disorders are accountable for 185 deaths, or more than 31 per cent. of the total for the week from all causes. One hundred and sixty-seven of these 185 deaths were among children under two years of age.

* Bulletin 41, Public Health and Marine Hospital Service in the United States.

"Notwithstanding these increases, the general death rate was more than 4 per cent. lower than the August average and 6.5 per cent. below the rate of the corresponding week of 1908."

This city has one of the most vigorous health officers in America, but unless such men can have support of city councils and the intelligent public, and especially of medical men, they may well say with Kingsley's cynic: "Back to chaos again, Raphael, and spin ropes of sand to the end of the farce."

THE MILK ORDINANCE.

I believe that milk inspection ordinances should develop gradually—undergo a sort of evolution process, start with rather mild restrictions, and should then progress along with public sentiment and public support. The general plan should be to work for education and free co-operation, and we should endeavor to develop public demand for good milk.

Legislation need not order inspection and tuberculin test directly, but should provide the necessity of license and then impose inspection, tuberculin test, etc., as conditions for obtaining license. By this plan milk producers are not compelled to submit to tuberculin test or city milk inspection if they do not wish to comply with the conditions. They are given an option of complying with the city ordinance or disposing of their milk otherwise. The big stick should always be used just as little as possible in this work where willing co-operation is so essential.

It may be best, at first, to impose tuberculin test or pasteurization, owners having the privilege of choosing. There will always and necessarily be some objection to new measures of this kind on the part of producers and dealers. Opposition is to be expected, but it need not ordinarily be such as to discourage or destroy the work, and may be overcome with tact and good judgment.

So far as examination of dairy cattle is concerned, it may be advisable to provide at first only for general veterinary inspection of dairies with clinical examination of the cattle and tuber-

culin test where clinical cases are found and for any owners who desire test. Such testing should be done upon request and at moderate cost for the owner, and the Health Department may properly publish lists of tested herds. With good management, provision for compulsory tuberculin test with rigid regulations for retesting and refilling, disinfection of stables, etc., will come as soon as the Health Department, veterinarians and consumers are ready for it.

Tuberculin work for most cities should be done by a city veterinarian with provision for owners to pay the city, the veterinarian being preferably employed on full time with no private practice to jeopardize by doing his duty. Paying the inspection fees to the city treasurer relieves the situation from suggestion of graft and leaves the veterinarian freer to do his work. For places so small that they cannot afford to employ a city veterinarian, then tuberculin testing may be done by any licensed veterinarian in good standing, the city health department or the state having authority to discriminate. The test should be applied to all cattle in the herd regardless of age or sex with the exception of young calves, and all tested cattle, reactors and non-reactors, should be permanently marked.

ORDINANCE ESSENTIALS.

The writer's views concerning the essentials of a good milk ordinance will be given in the form of the following summary which shall be almost as concise as Johnny's conjugation:

Dairymen to make application for license, and in the application agree to permit proper inspections and tests; provision for issuance of license which must be renewed at rather frequent intervals; vehicles, cans, packages, etc., to be plainly labeled as to owner; the health department must have authority to stop vehicles, take samples, inspect, condemn and destroy milk and milk products; specifications should be provided concerning the character of places where milk may be handled or sold, with specifications for general handling of milk and care of milk and

utensils; milk tickets should be either in the form of coupons or should be of metal; healthy cows as shown by veterinary inspection; tuberculin test by veterinarian, or option of pasteurization for a limited term of years; specifications for tuberculin test should be provided, the veterinarian making test to furnish affidavit, including plain statement of just what he did personally in connection with the test; careful provision should be made for prompt reporting of illness among producers and handlers of milk; specifications concerning bacteria count. In case of pasteurization there should be provided, in positive terms, standards covering the elements of time and temperature, cooling and efficiency.

Cleanliness and ventilation of dairy stables is important, if for nothing else than the dissipation of pathogenic bacteria and undesirable odors.

I have tried to make this as concise and inclusive as Johnny's conjugation. Johnny was a little boy. His aunt was a very precise schoolma'am. One day the aunt asked if Johnny was not going to the party. "No; I ain't goin'."—"Oh, my little dear, you must not say 'I ain't goin'.' Now listen: I am not going; you are not going; he is not going; we are not going; they are not going. Now, can you say all that, Johnny?"—"Sure I can. There ain't nobody goin'."

Our best authorities differ on many points concerning milk and milk production. They disagree as to what the fat standard should be. They have quarreled over the problem of as to whether carefully milk from the normal udder should be germ-free, and they differ as to the relation between bacteria count and dirt. They have disagreed on very many points, but have not disagreed on the fundamentals of: Health for cows producing and people handling milk; the necessity for intelligent cleanliness; avoidance of dust; prompt and persistent cooling; and the shortest time from cow to consumer. If we keep in clear view a sensible interpretation of these essentials, we shall not go far wrong in laying out the foundation of a good milk ordinance.

BOVINE TUBERCULOSIS.

Bovine tuberculosis must now be taken as one of the most important considerations in connection with any milk law or inspection service. In order to get the view I wish to present, please think of bovine tuberculosis in municipal work as merely a local phase of a national problem. In order that we may partially appreciate this problem, let us try to realize that Minnesota alone may have at present approximately 2,500,000 cattle, consisting of 1,092,000 milk cows and other cattle amounting to 1,408,000. We have to consider, in connection with these 2,500,000 cattle, about 146,000 barns in this one state, with the northern half of that state imperfectly developed and thinly settled.

Dr. Melvin reported * not long since records of 400,000 cattle as tested in the United States between 1893 and 1908. Of these 400,000 cattle tested during fifteen years in forty-five states reported, 9.25 per cent. reacted. This percentage of reactions is, of course, higher than would be shown by a general test of all the cattle in the country, were that possible, for the reason that the classes tested are not fairly representative in this respect of the entire cattle. However, these figures may help us to see more clearly the size and importance of the general problem.

Tuberculosis eradication is a very different problem from that of pleuro-pneumonia, which cost only \$1,500,000 and five years' work. The eradication of pleuro-pneumonia and both outbreaks of foot-and-mouth disease are trifling in comparison—mere child's play—when compared with the difficulty and expense involved in the eradication, or even rigid control of tuberculosis, and yet it must be done.

It is a magnificent task, staggering in size and difficulties, and yet it must be accomplished—and who dares say that bovine tuberculosis can not be reduced to a minimum and possibly eradicated. It is one of the commonest experiences in history that while wise men are proving the impossibility of a thing, some

* Address Tuberculosis Congress, Washington, D. C., 1908.

fellow is doing the demonstrated impossibility. While English engineers were proving mathematically that it would be impossible to ever build a smooth-wheeled engine that could draw a practical load on smooth rails, Stephenson was doing that very thing.

BOVINE TUBERCULOSIS AND HUMAN HEALTH.

What can one say here and now in addition to what has been said and published during recent years concerning the relation between bovine tuberculosis and human health. Truly, it may be that to some have been given the ears to hear and eyes to see; but without the grace to understand.

There are hundreds of open pages, authoritative and reliable, which have been freely before the public for years. The work of several commissions and a large number of competent, private investigators of tuberculosis gives an abundance of very satisfactory information which we may accept as a very pillar of fire to give us light—in the way wherein we should go.

May we not consider it as practically settled that bovine tuberculosis cannot be ignored as having an unimportant relation to human health when it has been so abundantly demonstrated that the human is susceptible to infection from the bovine even though it has not been proved that such infections are common.

MAKING A CITY ORDINANCE EFFECTIVE.

We all know how easy it is for a health officer to sit in his office and report to the public that dairies and creameries and dealers are now conforming to regulations and that everything is lovely. The health commissioner of a certain large city not so long since gave out for publication a statement which has been very interesting to me. I have read it and re-read it. This statement was given out just after a trip inspecting dairies supplying the city's milk. It has been hinted by presumably mean persons that the dairymen had a tip in advance that the health department was coming—by rail. This is the statement:

"We were more than gratified by the vast improvement shown since last year.

"On our journey we found nothing but gratitude for our alleged severity. We found that the milk is sent at once to sealed tanks, thence is drawn into sealed cans, and then is sent to this city, where the great companies put the product into sealed bottles and deliver them to customers, after which the purity of the supply rested with the customer.

"The farmers are now pleased with the rules, the dealers are pleased, the railroads are happy, and the distributors know that they are giving their customers milk just about as perfect as a food product can be perfect."

As a bit of humor this impresses me as something fine—artistic. Consumers are such serious-minded people; their lives doubtless need frequent splashes of humor as well as clean milk.

Such report is all very nice, but as the American boy expresses it, "it isn't getting there." Such inspection tours do not clean dairies or educate consumers. Copies of dairy rules may be beautifully printed on nice linen and put into dairy barns, but most of us who are personally acquainted with employers and employees can easily realize that some of the employers and most of the employees will read these rules and smile, unless the rules are made effective by competent and frequent real inspection and publicity.

I believe that the dairy score-card as it is now being developed can be made a very great help to the producer, to the consumer, the wholesale dealer, the veterinary inspector, and the health officer, when fairly used by real inspectors who know dairying. It emphasizes details and helps to see details just as the score-card in animal husbandry classrooms helps the student to see a horse in detail. It shows the producer a stimulating contrast between actual and ideal. From the score-card as published the consumer may have the benefit of something similar to an actual visit of inspection and be able to patronize the dairyman who has the best rating. From honest score-cards, dealers

can get efficient information concerning the rating of dairies, and the score-card should be a great help to inspectors by teaching them to see details, actually listing the things to be looked for and looked through.

INSPECTION.

For smaller cities, close official supervision and veterinary inspection is sufficient for good results, and a great improvement may be accomplished in this way by veterinary inspection alone for the large city.

In a recent issue of the Sanitary Bulletin published by the Chicago Department of Health under Dr. Evans, a very interesting report of inspection service for the first six months of 1909, as compared with the first six months of 1908, is given.

DAIRY FARM INSPECTIONS.

	First six months, 1909.	First six months, 1908.
Number of dairy farms inspected.....	2,785	2,524
Found unsanitary	911	1,112
Unsanitary on re-inspection.....	787	981
Farms excluded on account of unsanitary conditions	238	242
Farm supplies excluded on account of con- tagious disease	87	50
Wells condemned	200	248
Milk houses unsanitary.....	981	1,219

Dairy inspection alone is of great value and may be sufficient for small cities. It may accomplish great good for large cities as shown in the foregoing statement. However, it seems that something in addition is necessary for highly efficient service in large cities. It seems to me necessary to encourage and de-

velop the laboratory end of the work to co-operate with the inspector.

If our laboratory men are not now able to give needed information concerning milk contamination, and confessedly they are not as yet, it is up to them to get busy and improve their technique, develop new methods and tests, until they can detect pus and manure and evidences of udder inflammation. The dairymen who cannot show a plant and methods which can stand good veterinary inspection at one end and deliver milk answering to reasonable laboratory requirements at the other end should be barred from city markets regardless of conditions which the veterinary inspector may find at the farm. I would not in the least minimize the importance of the inspector's work. As already stated, I think it necessary, but would argue the necessity of inspection at both ends, of milk as produced and milk as delivered, the one to supplement and to check against the other.

A large proportion of big city milk comes from without the city and from long distances. Washington City milk comes from about 1,000 dairy farms located in a number of counties and two states. Cream comes to Washington from Pennsylvania and New York. A considerable part of Boston's milk comes from distances varying from 40 to 100 miles. New York's milk comes from 35,000 farms in five states and over twelve different lines of transportation. Some of her cream comes from Ohio, and milk at some seasons from Canada.

I do not know how veterinary inspection alone can be carried out with high efficiency or controlled at such distant points, and therefore believe it especially important to know what the milk from such distances is at the time of delivery. The only possibility of knowing this so far as the writer knows lies in the laboratory, and until the laboratory man does improve his technique and methods, we will simply have to do the best we can with what we have.

It is right and sensible to insist that dairy water should be pure, but to know that only pure water is used at a distant dairy

is a difficult matter. The commissioner in his office may order that milk-pails should not be rinsed with the water from watering troughs or shallow wells receiving surface drainage, but who is standing guard at the stable 50 or 100 miles away after the inspector leaves? It is very true that most dairymen do not do this and would justly resent any such imputations, but some dairymen would and do, and these are they for whom we inspect. Police service is always for the few, and never for the conscientious and reliable. It is the character and the probabilities in connection with these few that we must most prominently keep in mind.

The veterinarian does good and necessary work at one end of the route, but he cannot stay on guard; he cannot follow milk to the consumer, and there are opportunities for dangerous contaminations on the way. Much can milk is ruined in transit. As a writer in *Hoard's Dairymen* recently expressed it, "the average milk car is about the hottest place this side of h—." Milk so shipped may be started from the farm cold, and heat within two or three hours to 65 or 70 degrees.

I maintain, therefore, that we must know what milk is as it is being delivered if we are to use normal milk, and that our inspection service cannot reach needed efficiency without good laboratory service so far as the large city is concerned.

Laboratory work is already helpful. May we not anticipate that the laboratory man will soon be able to tell us whether milk is from a badly inflamed udder or is contaminated with pus or whether it contains more than a certain amount of high nitrogen fertilizer?

DEMONSTRATION PLANT.

Dr. Golor, of Rochester, suggested some years ago the establishment of model demonstration dairy plants at suitable places of easy access, *e. g.*, in connection with city parks. These were to serve as object lessons for both producers and consumers and for the direct practical purpose of supplying clean milk to those who frequent the parks. At such a plant good dairy methods

would be demonstrated. Why not have such plants in connection with the secondary agricultural colleges that are beginning to spring up over the country, or at consolidated rural schools (which seems to be the future rural school where local conditions are suitable), and why not such a plant under municipal or state management near each big city as a practical teaching proposition and for the immediate benefit of poor people who may be within reach.

If a large city can reduce her mortality rate for children under five years for a ten-year period ending 1896 as compared with a ten-year period ending 1906, from 7,451 to 4,965, apparently due in a very large measure to improvement in the milk supply, it becomes evident that reasonably vigorous and intelligent enforcement of a good municipal ordinance may accomplish a great deal for the community.

PASTEURIZATION.

Any full discussion of pasteurization would be necessarily a long discussion. I hope that this feature may have full discussion by others on this program who may cover the medical and technical features. I will only outline the picture as it appears to me.

One set of authorities tell us that careful observations and comparisons and clinical experiences agree that heated milk is just as digestible and even more so than raw milk and a safe food. Others say that heated milk is bad, very bad; both authorities can prove their contentions, and there you are.

I hope you appreciate the humor of such situations in scientific things. Both sides are quite able to prove their contentions. It reminds me of a certain philosopher's classification of lies: ranking them as "lies, damned lies, and statistics."

Clean and carefully handled raw milk is presumably better than pasteurized milk. No amount of pasteurization can make filthy milk clean nor bad milk good. Neither can it undo unfortunate changes that have already occurred, and yet——. Bad milk

is bad and pasteurization is objectionable, but moral philosophy appears to show that there are different degrees of badness. The man who visits many wholesale plants or visits a large number of city dairies soon realizes that he is confronted by a serious condition rather than a fanciful theory, and it is the serious condition that must be dealt with first; the fanciful theory can usually wait. In other words, there appears to be a choice between pasteurization under official supervision of a considerable proportion of municipal milk—at least for the hot weather—and a rapid and radical revolution in the city milk business.

The temperature question in pasteurization seems to be a sort of Scylla and Charybdis problem, with the chief difficulty that of steering between a Charybdis which would destroy the milk enzymes and rob of mineral matter by overheat, and a Scylla which would spare objectionable bacteria by underheating.

And we must bear this point in mind emphasized by Theobald Smith, that the hardest inspection problem in the present situation is the transmission of specific human disease germs through common market milk, and that this cannot be entirely controlled by any ordinary cleanliness at the dairy. Pasteurization takes care of this difficulty. If milk-borne epidemics of typhoid, scarlet fever and other diseases cannot be better prevented in the future than in the past, then pasteurization under city supervision of a large part of our municipal milk may become necessary.

Rosenau summarizes "Theoretically, pasteurization should not be necessary (he might have added "and is objectionable"); practically, we find it forced upon us."

THE PRODUCER.

The producer is a big factor in this equation which might be stated as: an intelligent and conscientious producer plus an appreciative and intelligent consumer plus well-trained veterinarian equals good milk. These are all essential constituents of good milk.

We veterinarians and physicians have our quarrel not with milk or any legitimate dairy products, but with dirt and disease. We are working for abundance of good milk at fair prices. Our contention is made in order that children may have the benefit of a greater blessing and that the producer may receive just reward for investment and labor. Healthy cattle are absolutely essential to the production of safe milk, and the veterinarian is the man to help at this point. He represents the health office and stands for the consumer.

The veterinarian's normal relation to the producer is that of advisor and helper. The veterinary inspector must know dairy work, its methods, needs, and difficulties, and he must be good-natured and tactful in order that he may be efficient and helpful.

Dairymen and dairy papers are demanding more intelligent inspection and are laughing at ridiculous mistakes of inspectors who know nothing of practical dairying. These have not been veterinarian inspectors as a rule but petty ward politicians. Let veterinary be careful that they are fitted for the work they may undertake. A profession cannot afford to have its members put into the dunce's class. It costs us too much.

WHAT THE PRODUCER IS ENTITLED TO.

Comparing milk with other foods at market prices, it is very evident that milk is a very economical food. Milk at six cents per quart gives a fuel value of 1,080 calories (heat units) for ten cents. Meat foods, beef, for example, at 15 cents per pound gives only 735 calories for ten cents. Milk at past prices has been a cheap food as compared with other staple articles, for ten cents worth of milk at six cents contains as much protein and fat and more fuel value than ten cents worth of medium priced meat at about fifteen cents per pound.

Take milk at eight cents per quart and rib roast at twenty cents per pound: at these prices ten cents worth of milk is equivalent to 19.1 cents worth of beef. The consumer ought to use more milk if he can get good milk and could with economy pay more than he has been paying for it.

COST OF PRODUCTION.

Cost of producing milk has increased very rapidly during the past few years. The Year Book, Department of Agriculture, gives the following figures for the United States:

	1895-1900.	1903-1908.	
	Average Dec. 1st.	Average Dec. 1st.	Per cent. increase.
Per bushel, corn.....	28.5c.	47.5c.	66.6
Per bushel, barley.....	38.5c.	48.7c.	26.
Per bushel, oats.....	23.2c.	36.7c.	58.
Per ton, hay.....	\$7.06	\$9.65	36.6
Average increase .....	....	....	46.8

Bran sold* F. O. B., Minneapolis, on September 1, each year: 1902, \$11.50; 1904, \$15; 1908, \$18.25, an increase of 59 per cent. in six years.

Cost of farm labor for Minnesota increased 23.2 per cent. from 1904-1909. The increased cost of farm labor for the entire country is estimated as not less than 25 per cent. since 1900 (Cooper).

Original farm-record work done in Minnesota by the experiment station in connection with the Federal Department of Agriculture shows the following for the cost and profit of producing milk in a good dairy section in Minnesota. Those who wish the details itemized: grain, pasture, labor, depreciation, interest, etc., will find this data in Bulletin 73, Federal Bureau of Statistics.

Northfield the locality from which this data was secured, ships about 700 gallons of milk daily to the Twin Cities. The average number of cows per farm studied is 16.4. No taxes were charged in the items of cost for technical statistical reasons. The figures average for 260 dairy cows, most of them high-grade Holsteins and in a good dairy section.

* W. G. Crocker, of Washburn-Crosby Co., Seventh Annual Millers' Convention, Chicago, 1909.

The average total cost of keeping these cows a year was \$56.91. The average annual production was 5,587 pounds; and actual cost of milk production \$1.02 per hundred, or 2.19 cents per quart. The farmers received for the year from 2 to about 3½ cents a quart. We will be generous and put the average at 3 cents a quart. The total gross returns per cow on this basis was \$84.37; net per cow per year, \$27.46, or \$442 a herd for a year's hard work. In Wisconsin* milk from a 5,000-pound cow costs nearly 4 cents per quart to produce; it costs about 2.5 cents per quart to produce milk from a 6,000-pound cow. Profitable Wisconsin cows must produce 7,000 pounds or over per year, according to *Hoard's Dairyman*, a good authority.

A recent bulletin † presents a study of the cost of producing milk and the dairyman's returns for Connecticut. I have selected three herds presenting two general types of dairies as to quality of cow and intelligence of management.

Herd Nos. 1 and 2 must be regarded as somewhat exceptional. Herd No. 1 is selected as a sample of an extra good herd well managed. Thirty-six cows averaged over 7,560 pounds of milk for the year with an average butter fat of 4.4 per cent. The average for the state is given at about 4,000 pounds per cow per year. The cost of feed alone, per cow per year, was \$74.80, at market prices, and yet these choice cows netted \$32.98 each. I should have said netted only \$32.98, for a herd of this quality, managed as well as this herd must have been, should have netted under fairer relative prices of cost and sale considerably more than this amount.

Herd No. 2 is selected as a fair type of a good herd. It consisted of 27 cows and averaged nearly 6,400 pounds per cow, with a very high butter fat, 5.4 per cent. This man's cost of feed, market price, was \$70.43 per cow, and this high-grade herd netted only \$15.24 per cow per year, or say \$411 for the herd of 27 cows working a whole year. In addition to these earnings a small profit was probably made from foods raised on the farm.

* *Hoard's Dairyman*, August 6, 1909.

† Conn. Exp. Sta. Bul. 57, May, 1909.

It is an obvious suggestion that as a matter of fact it is profit made on crops raised on the farm and sold at cost instead of at market prices, that keeps many a dairyman from failure. The average grade of cows and the average price of milk in many places is too low to show a balance in favor of his cow when she is charged with her feed at market prices. This appears to be the solution of what seems a mystery—how so many dairymen can continue business, raise and educate families, and apparently make some money.

Herd No. 3 represents the inferior herd—all too common. This herd of 29 cows, followed carefully for a period of nine months, averaged at the rate of 3.490 pounds per cow per year and lost the owner \$18.60 per cow during the nine months of observation, or at the rate of \$24.80 per cow per year. Without some radical change in cows or methods or prices this dairyman stood to spend about 720 good dollars for the fun of running a dairy. This isn't so bad either. I know of a famous western farmer whose superintendent was very proud when his books balanced within \$40,000 at the end of a good farm year.

A cow census reported for a certain dairy district in Wisconsin (see *Hoard's Dairyman* for March 5, 1909) gives figures for 50 herds including 533 cows, supplying a local creamery. The cost of feed per cow per year was \$28.76. The average profit per cow per year was \$9.16. Nine of the 50 herds showed actual loss for the year; 13 herds showed profit of less than \$10 per cow per year; 8 of the 50 herds paid a profit of \$20 or over; 1 herd, of 16 cows, paid a profit of \$37.72 per cow per year. It is much easier to show a good profit in milk production with ordinary herds and in different management when one does not count such inconvenient items as taxes, investment, depreciation, and insurance.

I would not for a moment be taken as arguing that the dairy business is unprofitable. High quality herds, and high-grade management under good market conditions, can certainly be made to pay a good profit and are being made to do so. But

we have to deal with general averages in this world and cannot base estimates or comparisons on the unusual.

The fact remains as suggested in a recent issue of *Hoard's Dairymen* (August 6, 1909), that a serious proportion of milk producers are not making money from cows and that the present situation is demanding better cows and greater intelligence than ever before. Bill Nye's plush raspberry cow will not do in these days. It is said that Bill Nye once advertised his family cow for sale, stating that: "Owing to ill health I will sell one plush raspberry cow which has undaunted courage and gives milk frequently. I will also throw in a double-barrel shotgun which goes with her. In May she generally goes away for a week or two and returns with a tall red calf with wobbly legs."

There have been too many such cows in service and too many dairymen like Mr. Nye.

Greater intelligence, better executive ability and better equipment must always call for greater returns. Efficient brains are not found on bargain counters, and when we count investments, feed, insurance, depreciation, taxes, interest, and brains it seems clearly evident that the average cost of producing average milk is such as to almost preclude the possibility of clean city milk of good quality at past prices; that the competent producer is entitled to better prices, and that on the basis of food value the consumer can afford to pay better prices.

The consumer is entitled to a hearing at this point. He ought to pay a fair profit on a reasonably good herd under reasonably good management; but the consumer should not be compelled to pay profit on poor herds poorly managed. He ought not to be asked to pay any profit at all; for instance, on the Connecticut herd No. 3.

WHAT THE PRODUCER OWES.

The producer owes some things to the consumer. He owes more intelligent management than he has been giving. We have about 600,000 city dairy and creamery cows in Minnesota of

which about one-fourth are kept at a loss, so a Minnesota dairy authority tells me; one-fourth barely pay actual expenses, leaving no profit; and another fourth pay a good profit. The support of the dairy industry depends chiefly upon this last fourth, and the consumer of Minnesota dairy products is asked to support 150,000 deadheads. This is in general true of other localities and of other states. There is an opportunity here for the milkman to contribute a very important share towards solving the problem of clean milk at reasonable prices. His opportunity and what he owes is to be a better business man and a better dairyman.

The producer owes other things. He owes intelligence, and conscience, and fair treatment for his patrons. Only a few days since I saw a barefoot boy holding the team while the dairyman was delivering milk. On the outside this dairy wagon was beautifully painted in white and gold and blue lettering advertising pure milk and cream; on the inside the boy was seated at ease with his dirty bare feet resting upon an open crate of paper-capped milk bottles. This occurred near by own home, and it is needless to say that we are not patronizing that dairyman.

Very recently four men were seen operating a first-class aerator in a feeding alley. A fifth man was feeding dusty hay up and down the alley to 52 cows, while the milk was spread out in a very thin sheet aerating, apparently so as to take up as much of the dust as possible.

The writer's cousin was once staying over night with a neighboring farm boy whom we will call Charlie Ford. In the morning Charlie went out to do his share of milking and my cousin noticed him holding an old-style open-top milk pail steady on the floor with his dirty, bare feet resting on the top of the pail. Once in a while, and sometimes twice, a stream of milk would miss the pail and hit the feet and drain into the milk pail. When my cousin remonstrated, Charlie remarked, "Oh! that is all right. We sell this milk."

The producer plainly owes to the consumer the prevention of just such carelessness on the part of his employees.

THE CONSUMER.

The veterinarian's relation to the consumer opens up a big question. He is responsible to the state and civilization in general for wise use of his talents and training. He is responsible as guardian of the consumer's animal foodstuffs, and as protector of the world's live-stock interest, the source of supply for those foodstuffs—a rather serious responsibility. And as to the consumer's importance to the state, why, the consumer is the state. "Public health is national wealth."

The chief consumer of milk is the child. The wealthy child can have good milk, but what of poor children. Paul Ford says in Peter Sterling that "The future of this country depends on its poor children; that in order to make good citizens, they must be saved from ill health and ignorance and vice, and that the first essentials are good food and good air. A little analysis shows that Paul Ford intended to tell us that the child's food determines to an important extent its grade of future citizenship, and that the future safety of the nation and, for that matter, of all civilization, depends upon grade of citizenship."

While considering the consumer we must not look solely at the city home and lose sight of country homes, for country boys and girls are just as important—probably more important to our civilization than city boys and girls. We must have an eye on the farm dairy and the family cow, and we must not forget the smaller creameries all through the country. Dirty milk is dirty milk anywhere and bad milk is dangerous anywhere and healthy children are vitally important everywhere.

THE ROOT OF THE PROBLEM.

The real difficulty, the fundamental fault, lies with the consumer, and this fundamental fault is lack of appreciation—lack of realization. Indifference is not the right word. People are not indifferent; they lack realization. People are not indifferent to their own health and the health of their children. The trouble is that they don't realize. The fact that people are not actually

indifferent and deliberately careless is frequently shown. What would people do, for instance, if they realized that smallpox was in every can or even every tenth can of milk—these same people who appear indifferent on the question of bad milk?

Successful veterinary inspection at one end and efficient laboratory work at the other may result in the production and delivery of good milk. The efficient city health officer may put good milk at the door of the consumer, but so long as his failure to realize is continued, results must be indifferent and progress slow. Standing in open cans, pouring milk from vessel to vessel, permitting the access of flies, standing longer than necessary out of the refrigerator, unclean containers, these are the faults of the consumer, and part of what he owes is the correction of these faults.

The producer, the dealer, and the veterinarian have accomplished all that can be asked of them when clean, cold, normal milk has been promptly delivered to the consumer.

I must quote again from an address by President Nichols of the Ohio State Dairymen's Association:

“Commercial milk was not intended by our Creator. He did not intend milk to be handled in rusty cans and dirty pails. * * * Had our Creator intended milk to have been bought and sold, He would have endowed some of our producers with more intelligence and integrity, and would have arranged for some plague to remove at least one-half of our milk dealers. He also overlooked the fact that the consumer should have had a little knowledge of the delicate texture of the milk. * * * It is hard to make the consumer understand that you cannot associate warm milk and turnips in the same ice-box without making them both into turnips.”

THE VETERINARIAN.

It may be assumed that dairy inspection should be done by the veterinarian on account of special training in diseases of animals and familiarity with live-stock conditions and dairy practice.

The veterinary profession within a few years and especially in connection with this work has been brought out into a large place, and he must make good. Over a thousand millions were invested in cattle alone by the United States in 1890. In fact \$1,400,000,000 were thus invested in cattle alone nearly ten years ago. This vast interest is threatened on every side by diseases and loss, and we veterinarians must stand as protector between infectious diseases of animals and public interests. Some diseases of animals are communicable to man. His animal foods are constantly subject to dangerous contamination, and so the veterinarian stands also as a guardian of human health.

About one-half of the deaths in children under two years of age are due to digestive diseases, chiefly infantile diarrhoea. The feeding was carefully studied in a certain series of 54,047 deaths among infants. Of these, 86.6 per cent. had used artificial food, and cow's milk is the standard artificial food, and yet milk, as milk, is not in the least to blame. Neither is the producer wholly at fault. There are others. Before we find too much fault with our partners, it might be well to be sure that we veterinarians are taking care of our own responsibility. Suppose now that we face squarely that responsibility:

THE VETERINARIAN'S TASK.

Failure to realize seems to me a logical explanation of the consumer's apparent lack of interest and the root of his refusal to pay fair prices for good milk. Here is the trouble and here is part of our task—overcoming this lack of appreciation and developing an active and intelligent interest. The remedy for the real trouble is real education, interest and information for the consumer. The consumer is from Missouri and we must show him; we must help to make him realize it that he must pay for what he gets. We must make him know that there are dairies and dairies and help him to want good milk from clean dairies.

Within a very few years Minneapolis lost an ideal milk plant because Minneapolis people would not pay a few cents more for

good milk. It is of no use to coax producers to establish certified milk plants until we get folks ready to patronize them.

We must have public support.

PUBLIC SUPPORT.

In all sanitary control work it is necessary to distinguish between what is merely unæsthetical and what is actually insanitary. Frequently they are two very different conditions, as was clearly brought out in our packing-house investigation of a few years ago. Even milk may be unattractive or repulsive and yet not seriously unwholesome. It may be white and nice looking and dangerous to the last degree. The function of the health department and the veterinary inspector is with questions of sanitation, not æsthetics. It is our serious duty to be very sure of the wolf, and not cry "wolf! wolf!" when it is only a stray sheep seen by dim light. False alarms can accomplish no permanent good.

The people we are to reach must have faith in us, and we need to realize more and more clearly that rank and recognition and public confidence depend on individual members of our profession. If we are to do this work and really accomplish our task we must command public respect and confidence, and we are to remember all the time that "Science is most noble when most useful."

THE PHYSICIAN.

The task of the physician is the same as ours in many points. We have the same general problem of conserving human health and saving human life and promoting general prosperity. We have to face the same lack of appreciation among the same people, and we have the same inefficiency in public service to take account of.

The writer has recently had opportunity to study * carefully tabulated records of 179 milk-borne typhoid epidemics, 51 out-

*Milk and its Relation to Public Health, Bulletin 41. Public Health and Marine Hospital Service, United States

breaks of scarlet fever, 23 outbreaks of diphtheria, given in all necessary detail. These present a disgusting story of typhoid milkers' careless disposal of typhoid dejecta; of washing cans with filthy water and other similar facts reported over and over again in a long series. Such study fairly makes one rub his eyes and wonder if we have not been suddenly transported backward with Mark Twain's Connecticut Yankee to the mythical times of King Arthur. You may recall Mark's descriptions of the dungeons.

Here in this milk-borne infectious disease work is where the necessary co-operation of the physician comes in again. Together we must reach and teach concerning the ease and danger of contaminating milk and milk vessels by germs of infectious diseases.

CONCLUSION.

Contamination of human food is an old, old question. Truly the poor wise man has cried in the street, but his wisdom was despised and his words were not heard. The cry "There is death in the pot" was raised long ago, and progress seems slow. May we not hope that some modern prophet may soon be able to throw in the saving meal of intelligent public interest and thus remove the poison?

Perhaps this sanitation movement has not been so slow either as the world of human society moves. Why it has been but a few years relatively since the executioner of Copenhagen was issued a license to set human bones and treat wounds. It has been less than a century since the sturdy hangman, Erick Petersen, served as a surgeon in the war with Sweden and retired with the rank of surgeon-major—at about the close of our own war of 1812.

Progress seems slow, but a movement is slow only by comparison and possibly we have been at fault in our comparison. It may be that great sanitary reforms are like Mark Twain's famous jumping frog of Calaveras County—too much weight for rapid movement.

If we would hasten progress, somehow or other people must be made to realize that there is a vast difference between good milk and bad milk, and they must become willing to pay for quality and cleanliness. It does take executive ability and agricultural knowledge to produce a clean, wholesome milk, and while there is nothing strikingly expensive about the production of reasonably clean milk, it costs more than poor milk and the consumer must pay that additional cost.

A prominent physician has given a solution—so far as production and transportation are concerned—for the pure milk problem: "Milk to be drawn from perfectly healthy cows kept in sanitary quarters, milked by clean and healthy persons into a sterile container, quickly cooled, transported, and delivered to the consumer in sealed packages." Note that most of these items, five out of seven, have to do with conditions at the stable and with cows. The cow as milked, the milker, the stables, utensils, and cooling milk on the farm.

Did you notice my exception: "Solved so far as production and transportation are concerned"? The problem is not solved until we modify his last condition by inserting the word "understanding" just before the word "consumer," making the last clause read "and delivered to realizing consumer. These are the specific, practical things for which the producer, the consumer, the veterinary profession, and the medical profession must work, and there can be no great success with either horse pulling on slack traces.

Let us learn how to work and wait—to work while we wait.

"He that will have a cake out of the wheat must tarry the grinding."

THE HORSE WILL STAY.—There's room for both the automobile and the horse, and although if the horse is skittish the automobile may crowd him into the ditch, it isn't likely to crowd him to the wall. The old family nag will long maintain his supremacy in his own field. The human love for horse flesh can't be narcotized by mere machinery.—*The Hartford Times.*

THE RELATION OF THE AGRICULTURIST AND DAIRYMAN TO MILK HYGIENE.*

ADDRESS BY EX-GOVERNOR HOARD, FT. ATKINSON, WIS.

Mr. President, Ladies and Gentlemen: I do not see where I have got any foothold after hearing this question so exhaustively discussed by Drs. Evans and Reynolds. I think you might justly drop any further discussion because they have essentially stated the facts. Milk is an animal food, and that makes me think of a story. Clark Howell, of Atlanta, told me this little darkey story, and I do not know but what it illustrates very well the utter lack of appreciation that consumers often have. An old darkey was taken very ill. The doctors couldn't fathom the disease. Finally one said to him, "I want you to do just what I tell you." "All right," said the darkey. "I want you to live on nothing but animal food for five days. If you will do that, then I will undertake to prescribe for you." The old darkey said he would obey the doctor's instructions, but the doctor was evidently suspicious. So he called up his old wife and he says to her, "Auntie, you see that the old man has nothing but animal food for five days." "All right, doctor." He went away and came back in five days. The old darkey was a sight to behold. The doctor was shocked, and he says to him, "Why, what's the matter?" The old darkey says, "I don't know, sir. I don't know. 'Pears like I was passing away." "Well, I should think as much. Why, you are looking awful. Have you done what I told you?" "Yes, sir." "Did you eat nothing but animal food?" "Yes, sir. I done eat nothing but animal food. I got 'long first rate with the corn, but the hay most killed me." (Laughter.) That is about as accurate a comprehension of milk as an animal food

* An extemporaneous supplement to the papers presented by Drs. Evans and Reynolds at the joint session of the A. V. M. A. and C. M. S., evening of September 8, 1909.

as that which a large proportion of consumers have. My son is the proprietor of a number of creameries, called Hoard's Creameries. They supply about three thousand families in Chicago, and about five or six thousand in Pittsburg, St. Louis, and some other places, where the deliveries of butter and other products are made at the door of the consumer. Now the utmost pains are taken in the manufacture of the butter, but the consumers, in a large number of instances, have an utter lack of comprehension of how to handle decent butter. Good butter. So, our distributing factories had to undertake a course of education with the housewives represented in that large interest, amounting to about two million pounds of butter a year. And it is a good deal so with the milk question. Now I am not going to enter into any philosophical dissertation on this question. I am a breeder of registered Guernsey cattle. I run a farm and own a herd of these cows, about forty in number, representing a large value, breeding value, besides a milk value. I have to handle the question with the widest comprehension possible concerning what is the truth for me. I am also supplying about two hundred consumers in the little city of Fort Atkinson where I live. I will give you a little illustration of how I commenced to supply them. I have three sons, and their families, a grand-daughter and her family, and I was simply trying to supply the Hoard family without any consideration for anybody else. One day a doctor had a little infant baby, a patient, that was evidently going into a state of actual starvation. The little thing would take no milk of any kind. They were trying to feed her out of a teacup, but she refused the food and was actually going down from lack of nourishment. It was a little eight months' old baby. The doctor was frantic over it, and, in his solicitation for her, said to me one day, "Won't you let me try your milk?" "Well," I said, "I do not think it is any better, maybe, than any other milk, though I have taken very much pains with its production," for I had babies of my own that I was responsible for. They took that milk and have done well on it. However, I gave him a bottle of the milk and he took it and gave her a spoonful of it so she should not get too

much down at a time. Her little face commenced to lighten up all at once. She looked up appealingly for more, and then they commenced to give it to her, and they gave her less than half a cupful. The beads of perspiration started out and the doctor said, "Thank God, the crisis is past." It was almost a dramatic moment with the parents of that little child. I never have been able to satisfy myself what there was in that milk that that baby sought for. I ran across a very learned book written by a Hungarian physician, entitled "The Influence of the Nerves of Taste Upon Digestion," one of the most profound books I have ever seen or read. I found there a very good solution of this question. The milk was good in flavor, and flavor was one of the great essentials of good digestion for infants' milk. The milk of the Guernsey is a well-flavored milk. I do not know as it is any more so than others, but these cows were kept carefully. They were cleaned, automatically cleaned. The stable, the floor, the stall, everything about them was kept in a scrupulously clean condition. The stalls were constructed so that they forced every cow to be clean. It is almost impossible for her to be stained even. What a sight it is sometimes in a stable to see a cow all stained with filth. My cows, if you look at them in the spring, even though they were not groomed, will not show any such sight as that. Their flanks are as clean as though they had been washed. The second thing is the thorough ventilation of the stable, which is 142 feet long, and contains over fifty animals. That stable is so arranged that the air changes there very hour. I have the King system of ventilation. I got Professor King down there. I sent for him and I told him, "I want this thing from you at first hand. I want this stable right, because I have a selfish interest in it. As a breeder I cannot afford to keep diseased animals. As a breeder I cannot afford to sell diseased animals. As a producer I cannot afford to sell product from diseased animals." Now, my friends, the proposition with me is very simple, so simple that men stumble over it. Do you remember ever seeing that little picture of the old German whistling for his dog. The old fellow, you remember, had a very large

stomach on him. And the dog was down here at his feet, and yet the old German was constantly whistling, "Where is that dog? Where is that dog?" There is a whole lot of truth in these simple things sometimes. Now the difficulty with the production of milk, sanitary milk, edible milk, if I may use that term, milk that can be safely taken, and the knowledge concerning it, is not the number of bacteria per c. c. that we find in the milk. The difficulty lies back of this proposition. You know when I contemplate this proposition from the standpoint of the veterinarian, and I simply think that sometimes I try to do so, but when I contemplate it from the standpoint of the farmer, and when I contemplate it from the standpoint of the consumer, I conclude that the prayer that Christ uttered on the cross, "Father, forgive them, for they know not what they do," is very applicable in this case. And it is true. Now to simplify the proposition. In the first place, about twelve years ago I determined that I would have a herd of cows free from tuberculosis. I have been having a controversy with my friend, Dr. Smead, of New York. I do not know exactly how we are coming out. I do not know whether the doctor does or not. I would feel a little better about it if I thought I did. The doctor says that the system that I pursue, or rather he characterizes the system I pursue, as narrow and illiberal. But my observation of the disease is this; that it is the most narrow and illiberal thing in God's world. You cannot help yourself, limitations are such. Well, I commenced twelve years ago, about the first, I think, in my section to test my cattle with tuberculin. I heard that the tuberculin test was not reliable. I heard that it was not accurate. I heard all sorts of things. I concluded that I knew of other diagnostic agents, but that I knew of none as reliable, as searching, and as efficient as tuberculin, and I committed myself to it. I killed seven very valuable animals. I could not say whether I might not have kept them or not, but I proceeded to give a most thorough overhauling and a most thorough disinfection. I used whitewash liberally. I went after the proposition in the most effective and thorough way I could. I have been at it from that day

to this. When I first started it took me three years to clean up the herd. From that day to this I have had a herd in which there has not been a single reaction, and it has been tested every year. Several members of that herd have died from various causes, but there has not been a case of tuberculosis in it. Not a trace of tuberculosis among those animals. (Applause.) It has been a very simple proposition with me, so simple that I do not wonder there are times when some stumble over it. But I know of one great reason. One is the selfishness of men. Men are selfish. Born so, and unwisely so, too. Many a man will confine the proposition of testing his cattle and trying to clean out the disease and do it with an hypocrisy that is almost sublime. I know of no instance which better illustrates what I mean than the case of the old German up in my county whose wife died. In three days he married another. The boys gathered around his home and gave him a serenade. They hooted and sang until there was no sleep for a mile around. Finally, the old man came out upon the doorstep and he says, "Boys, boys, why don't you be ashamed on yourselves to make such a noise around this house when there been a funeral here only three days ago?" And it broke up the mob. The boys, come to think of it, thought that it was a pretty raw proposition. It broke up the mob and they left.

Now I happen to be the editor of the paper which was alluded to this evening, *The Hoard Dairyman*. In that I have believed that I ought to put emphasis upon the truth wherever I found it; wherever the truth lay, as I understood it, and so I have advocated that it was the duty of every dairy farmer in the country to set to work at once from the standpoint of his own interest, as a cattleman, to eradicate tuberculosis from his herd. Now the initiative ought to take place with the farmer himself. He ought to be enlightened, but when it comes to the question of a law what can you do in legislation? That is another thing. It often happens that prejudice takes the place of intelligent conviction in the minds of some legislators, and the result of it is that farmers, as a rule, dairy farmers, cannot face the proposition courageously

and get rid of it. I want to say to you gentlemen that a little incident that happened to me when I was a boy twelve years of age has helped me very much indeed. I had an old grandfather, a good old Yankee, who did not lack courage. One day I saw him in a tremendous fight with a bull in the barnyard. He was fighting for his life with a pitchfork in his hand. The bull would charge, and the old man would dodge and plunge the fork into the flank of the bull. I was about to get over into the yard to help him. I was frantic. I feared that the old man would be killed, but he called to me, "Keep back, my son, keep back." And that fight went on until finally the bull was being punished so that he began to wilt, and he finally laid down on the ground and died. I clambered over the fence. I felt that I had a profound admiration for that game old man. I said, "Grandfather, you are the bravest man I ever saw." The old man's face flushed as he caught this compliment from his grandson, and he says, "My son, I want to give you this little bit of advice. All through your life take counsel of your courage and never of your cowardice, for when you counsel with your courage you will face your danger, and if there is any show for you, you can see it, but if you counsel with your cowardice, your back will be turned to it, and God knows what will happen." So with this proposition, we need to instill into the farmers of this country the idea of counselling with their courage. If we can get them to counsel with their courage rather than their cowardice, they will soon realize that it is better for them to do what they can to exterminate the disease. I am not in favor of radical legislation on this question. I believe we should go no further with legislation than the general sentiment of the people will support, because the sense of the governed is the essence of law, but I do think, gentlemen of the veterinary profession, and everyone else within the sound of my voice, I do think that we approach the solution of this question, especially some phases of it, with too much timidity. It is time to speak out. It is time that the veterinarians of this country spoke out in no uncertain tone. If they do, much can be accomplished toward the solution of this question. (Applause.)

Now then I want to add a few words with regard to what the consumer must do. In the first place, the consumer must have an instinct of cleanliness, instinctive cleanliness. I do not have very much confidence in a man who is doctrinally clean, who is educationally clean. I would not marry a women that had been made clean, but I would marry one, if I wanted one, and I did marry one, and one of the great inducements which led me to do so was the fact that she was instinctively a neat clean girl, and from that day to this I think my health and the health of our children has been largely augmented and may be preserved by that powerful instinct of cleanliness which she possesses. It is what some of the old Yankee women used to call "poison neat." Now that is what we want to inculcate among the farmers of this country. Instinctive cleanliness among the thousands of farmers that are making and selling milk, butter and other dairy products. One of the first things we need is ventilation. Furthermore, we need to produce a race of veterinary doctors who will do what they can to spread the idea of the ventilation of stables on the King system, for that is the only perfect system I know of. The only one that operates thoroughly and practically.

Then another thing we need: we need to be extremely careful with regard to the disposition of the manure of our cattle, and we want to advocate it every time we go out among the farmers, and it is the only safe thing for you to say, and it is the only practical thing for you to do, and that is, to get rid of the manure from your stables every day. Get it out and put it on the land. Clean up your barnyards and clean up your stables. If we can get the farmers to do that it will go far towards the establishment of a high sanitary condition for the production of milk. The care of the stable is a very important point. I use land plaster. Land plaster is constantly used to take up the moisture and to keep the interior sweet and clean. I have used land plaster for many years. I want that because of its value to me on my land. I want to retain all the nitrogenous qualities of my manure and put it back upon the land, and I want it in my stable because it helps to sweeten the stable. Then I use also a certain

amount of phosphate rock. In all these things in my farming I am looking out for the condition of my soil as well as the condition of the stable itself. Now you take that row of cows in that stable and look them over, and you will see a number of things indicative of good high condition. You step into that stable after the barn has been shut up for twelve hours, from six o'clock at night until six o'clock in the morning, and the air is pure. It is good. It is sweet. Many of you men have stepped into stables where it has been almost impossible for you to take a smell of the air inside. Now don't you think those cows are in a different condition from what they would be in an ordinary stable? Of course they are. Pure air is always healthful. Every one of you that have ever had a country practice know that when you have stepped into some cow stables, when you have opened the door, it has nearly knocked you down. Now that indicates a condition of affairs that we need to correct. It is productive of tuberculosis, of disease. It does not show that the farmer understands his business. It shows, on the contrary, that he needs to be educated. The veterinarians of this country, better perhaps than most other men, are in a position to help correct that evil.

Then another thing, a man should be a good feeder, should feed his cows wholesome food, and he should nourish his cows well. For I want to say to you that well-nourished cattle have a resisting power of disease which it is very desirable to give them. Do you realize that we ask of the cow to bear the most serious burden of any domestic animal? We ask her to produce a profitable amount of milk, and at the same time to procure a rugged healthy calf. That poor mother is called on as no other mother is called on. No wonder that the Hindoos called her the great nourishing mother of the race. I want to tell you that she is the foster mother of about half the children. (Laughter.) I have no criticisms to make, but I think the cow is a great essential to the future of the race. The cow should be fed nourishing food. The man that feeds her should be a student of feeding. Now I have found, and in saying this I am simply dropping a few little plain homely hints as I pass along, but I have found that a ration

of thirty pounds of good corn ensilage, which is one of the most wholesome foods in the world, added to about ten pounds of alfalfa hay, will put my cattle into splendid condition. Those cows are strong performers, producing last year an average of 8,240 pounds of milk, or over 4,000 quarts. About 446 pounds of butter fat, or 524 pounds of butter. That is in the official test. Now they were not crowded, but they were intelligently encouraged.

Then another thing: I am going to touch on a point that I want you veterinarians to think about. The intelligent farmer must be an intelligent breeder. Not simply a matter of cattle, but an intelligent breeder, and he must breed for constitution. He must breed not alone for performance, but he must breed for constitution or resisting power, and I want to tell you what I have learned about breeding for constitution. A little experience of mine which I am going to relate may be of some value. I was a soldier during the Civil War. I had been a student of medicine for a couple of years, and an English surgeon and medical man, attached to our army, and whom I met, gave me a point of view that has been of great value to me. He was one of the most profound men I ever met. He understood that I had had some medical study, and he asked to have me detailed to accompany him unto Pennsylvania where we were to take charge of the draft. Some of you may remember how men were examined in those days. Stripped and carefully examined as to their physical condition. I saw him reject a man one day who was as fine a built man as I ever saw. I was surprised, and so I asked him why he had rejected that man. His reply was, "That man has no constitution. He has no endurance. He will go down quickly and easily." I was interested at once, and said to him, "How do you at once determine so quickly that he will go down?" He brought him up in front of me, and he said, "Look at his abdomen." The moment I saw it I saw that there was something lacking. He said, "What do you see here? That which we call constitution, endurance, the power to resist disease, to hold up under the working of any function is imparted by the mother.

The mother nurses the foetus through the umbilicus mainly. Any good man, if he has been an observing man, and that is particularly true among veterinarians and the medical profession generally, has observed that when a baby is born and the umbilicus is weak and spindling that it is almost impossible to raise that child, but if, on the contrary, it is full, strong, and the channel of communication between the mother and the child is natural, normal, full, why then the little fellow comes into the world ready for all that the world has got to give him." "Why," I said, "doctor this is exceedingly interesting," and I said to him, "Have you ever carried this theory out or attempted to apply it to animals?" He had not, but there is no reason why the general principle should not apply to animals as well as men. Then I took a special course of study with him as to the structure of the abdominal walls. Now let me give you a little illustration. I have been a breeder of fox hounds. A man brought me a pair of fox hounds one day, a brother and a sister, laid them down, and he said, "What do you think of them?" I looked them over and I said, "I should think that the dog has a very keen nose, but I do not believe he will run an hour. The sister I believe would run all day. I know nothing about them, but what do you think of them yourself?" Well, he said that he agreed with me. The abdomen of the dog was thin. It lacked power. It lacked constitution. That was not the case with the sister, and he said to me, "There is no doubt about it. She will run all day. You cannot pull her off the track, and, on the other hand, you cannot keep him on the track."

Now I made three thousand separate studies before I ever said a word to the world about this proposition. I made three thousand separate studies concerning the power to do work, the power to endure the work of natural functions, and, gentlemen, I have never found it yet to fail in one instance. In breeding my cattle I strive particularly to breed for constitution, the ability to resist disease. I want to say to you that you and I have pretty much only one thing to our credit in this world, and that is the power to resist it. So with our cattle. Now, the producer and

his relation to this question must be provided for in the light of intelligence and study, and I want to say to you that, in my opinion, your profession has a greater work to do in forming that man's intelligence than any other I know of, and I beseech of you that you take hold of the farmers of this country, and without gloves, too, and see to it that, to the extent of your power, they are instructed along this line. Be fair, faithful, open and frank in instructing them concerning the laws that apply to the biology and physiology of his domestic animals. The farmer needs that instruction and he needs it sorely. This tremendous great cattle industry is suffering. As the Bible so well says, "Yea, the people perish for lack of knowledge." Everywhere, in our schools, and everywhere else, there should be taught something which will give a man a chance to equip himself for what he is to undertake in after life. That is a form of education that the farmer needs sorely. Our so-called higher education is up in the clouds while the feet are perishing. We need to do something, we need information taught and disseminated through you, through the press, and through everybody, concerning the production of a sanitary, or a harmless, and of a nourishing food, and milk as such is at the head of the list.

Now, I have just enumerated a few things. I have taken my own case. I have not talked upon theory so much as I have tried to tell you something which has been demonstrated to my satisfaction, at least, by actual practice. I am obliged in my little town to almost fight to keep people away. I have got an old German who sells milk for me that is about as cross an old bear of a man as can be found. He says, "Mine Gott, if you want troubles you have business with women on milk wagon." He walked in one day to my daughter's house. She had complained because the milk was sour, and he walked right into her parlor one day while she was entertaining some friends, with a milk bottle in his hand. He had just received it. He placed up under her nose, and he said, "You say dot milk ist sour. You just smell of that." Well, it amused her so, the humor of it was so great, that the lesson was taken good-naturedly. The hired girl

had given back to John a dirty milk bottle, and John knew that it was impossible to make that milk right. So I say everywhere there is knowledge needed. Now the farmer needs knowledge, needs it badly, and he needs to get it from you, and he needs to get it from every earnest thinking man in the country upon these questions and as to the philosophy of his own life. For, gentlemen, I want to say to you that the farmer's life is a most profound life when you consider all that it touches. It is not a very great science or a very great thing to be a banker, nor a very great thing to be a lawyer, for the lawyer deals only with human-made laws and the interpretation of human-made laws, but the farmer deals with the laws that God Almighty has made, and it is a tremendous big man that can interpret the laws of God Almighty. Therefore, the farmer to-day needs more than any man in the land, because he is the caterer and purveyor of all others—he feeds the people, and he needs knowledge on these questions and needs it sorely. Food and clothing come from the soil, that is, originally, in the last analysis, and nowhere else. Food and clothing constitute the great bulk of commerce. They are the established wants of man. All that we call business, especially in its simpler elements, is conducted with the primary idea of furnishing simply food and clothing, coming back to that one great thing, the nourishment of our bodies and the covering of our bodies. Now when you allow anything to come between the farmer and the consumer, when you allow anything to come in which affects our food products, when graft and corruption creep in, then adulterations follow. Education of the farmers of this country will do much to correct that. When I was in Washington, while I was there as President of the National Dairy Union, in regard to the oleomargarine law, John Sharp Williams, who is now in the Senate, and I might say in passing that he is well named, for he is sharp both in name and tongue—he said to me one day when I met him in the corridor, "Isn't oleomargarine as wholesome as butter?" I said, "No, no." "Why?" "Because God didn't make it. He did make butter, butter fat." And then I followed him up and I said, "Stop a moment, Mr. Williams.

Just think of that question. Butter fat is the only raw food prepared by nature in the whole organization for the tenderest of digestions, and that is infant digestion. The natural food from the mother that suckles in the whole animal kingdom puts butter fat into her milk, or the element of fat, but if you take out that fat and put in oleomargarine the infant will die. Why? Why, because it is not as wholesome and it does not have the nourishing elements in it. It is not designed and it cannot have the effect of butter fat. There is no form of fat that can fill the place of the food known as milk." Therefore, don't you see that we need everywhere sound wisdom in its production and care, that we need to promote knowledge concerning it. It is a vast question. It relates to the health and well-being of millions of our fellow citizens. This profession of yours must of necessity have an important relation to the future of this great question.

Gentlemen, I have spoken in rather a rambling way to you, but nevertheless I have spoken earnestly. I feel that the veterinary profession to-day stands in a more important relation to the well-being of agriculture, and of those dependent upon agriculture than any other profession on the globe. (Applause.)

It was not a case of a skeleton in his closet, but at his door during fair week in Hillsboro, Ohio, when the skeleton of a Welsh pony, mounted by the famous House Tramand, Paris, France, was exhibited outside of Veterinarian Howard's office, of that place.

NO DOCKED HORSES FOR HER.—One of the speakers at the Anti-Vivisection Congress at London last July told how Canadian women had presented Queen Alexandra with several long-maned, long-tailed horses, which prior to their despatch were docked by the veterinary surgeon. The Queen is opposed to the practice of docking, and the horses were returned to Canada. They were replaced at the veterinary's expense by undocked animals, thus closing an incident which the veterinary had turned from a pleasant into an unpleasant one. Long live the Queen!—*Our Dumb Animals.*

DISCUSSION OF THE CLEAN MILK QUESTION.*

BY PROFESSOR RUSSELL, OF MADISON, WIS.

Gentlemen, you have made a serious mistake. Any audience that has the privilege of hearing Governor Hoard speak knows that it is *lèse-majesté* for anyone to say anything after he is through. I am sorry that so egregious a blunder has been made as to bring me on after Governor Hoard has been speaking. It is not fair to you in any sense of the word.

I came down here thinking that I might profit by something that I might hear. I came here a perfect stranger. The first thing as I came in from the street I was asked to register. I said, "I am not a member of this Association, why should I register?" "Why, because we want to add one more name so we will be sure to get our reduction on the railroads." So, out of courtesy to the person who made the request, I registered, and that is how I came to have a badge. I drifted into a back seat, and in a few moments some one asked me to come up on the platform. Now that is taking, it seems to me an entirely unfair advantage of a little fellow like myself, to be asked to follow a man like Governor Hoard in the discussion of this great economic question. If I had the temperament of Governor Hoard and was able to respond to this request with the gifts of the orator, or if I had been specially prepared, it might be different, but, under the circumstances, it is not fair to me, and that unfairness, you see, is on both sides because it affects yourselves in what you will hear a well as in what I will say.

However, now that I am on my feet, I would like to say one or two words in regard to certain phases of the question which have been touched upon, and which I think can well be emphasized, perhaps, somewhat further by way of discussion. The one

* Discussion extempore, at the joint session of the A. V. M. A. and the C. M. S., evening of September 8, 1909.

problem which, to my mind, is of the most importance in this matter of the production of a pure milk supply at the present time is to change our ideas from these intensely high-grade standards that have been set before us by the people who have been producing certified milk, and to bring them down to what you might call a more common-sense standard. For some ten or twelve or fifteen years, and I do not know but more, our large cities have been supplied by individuals who have been selling us a high grade of certified milk, costing from twelve to sixteen cents per quart. They have been using the very greatest precaution in order to produce such a supply as they desired to sell to the public. Now that is laudable enough. I am not criticising that. It is very fortunate indeed that towns of this size, or even smaller, have had within their limits people who are benevolent enough to go down into their pockets and pay ten or more thousand dollars per year for the privilege of holding up to the community an ideal standard, and that is what some of these people have been doing, so far as my experience goes. A very few, if any, of them have made any money out of the operation. Very few of these plants are plants where the financial part comes out on the right side of the ledger. It is usually on the red ink side. Now what we want at the present time more than anything else, as it seems to me, is not a campaign to promote the growth of an intensely high standard but what we need is what you might call simply common pure plain milk, good milk that can be sold at a reasonable price. If I am any judge of public sentiment, that is what the public demands and what the public wants, and it is what, in my opinion, the people ought to be able to get, and what they are willing to pay for. Now the production of milk at a cost within the limits of the pocketbook of the average man is not an impossible thing. It ought to be the easy thing. The production of good milk within reach of the average man does not cost large sums of money. It does not cost large sums of money to produce simply pure wholesome milk. That can be done by any competent dairyman at comparatively small expense. The getting out of this milk of a few thousand bacteria that are neces-

sary, the reducing of the number in order to come within the limits is what makes the cost in the production of the milk supply. A milk supply can be produced that will come within the limits of any standard at comparatively small increase in expense over that which it is now costing the producer to produce the ordinary common supply, but when you go beyond that and attempt to reduce the number of the germ content to beyond ten thousand, you increase the expense in reducing it from a hundred thousand down to ten thousand, and that is what sends up the price so abnormally. I am satisfied that that can be done. I have met in Wisconsin many producers of milk that are simply taking the ordinary decent precautions that should be taken by any intelligent farmer. Here and there over our state we have got men that are supplying milk, not such as Governor Hoard is supplying at Fort Atkinson, but where the germ content of that milk runs from ten to twenty or thirty or forty thousand bacteria per c. c., and which, if it was to be put before your milk commission, would be rejected on account of the fact that it did not come within the sacred limit of the ten thousand, but it is good milk, which is wholesome, and it can be produced at a mere fraction of the expense that it does cost to produce this very high grade certified supply. The introduction of these high grade certified expensive supplies are all right enough for infant feeding perhaps, but they are altogether too expensive for the common pocketbook, and if we could produce a milk supply that could be sold, say, for about one cent per quart above the common grade, very many people could be induced in a short period of time to take it. They would become educated to the use of a better supply, and would take such a supply, but when you jump from the common price to ten or twelve cents, and even beyond that, that is beyond the pocketbook of the great majority of people, and they feel that they cannot afford it. For that reason I hope a way will be found to supply a thoroughly good grade of milk at a medium price.

Now, just one word more in regard to another phase of this question. It is so important that I want to say just one word to

further emphasize the point, and that is the education of the consumer. The great trouble with the dairy business to-day, as far as the milk supply is concerned, is that the consumer is not a discriminating consumer. There is no product that we have that is so cheap to-day. I was brought up in a little country town, and in my work in a little country grocery we handled hundreds and thousands of pounds of butter. The milk of that little country village sold at five cents a quart, and it sells at five cents a quart to-day. It has not got beyond that same price where it stood thirty years ago, and butter is still about twenty-five or thirty cents. Now you see the manifest injustice which arises when a dairyman is obliged to sell his product in the form of milk for that much lower relatively to-day than what he had a generation ago, and the difficulty of that comes in the fact that our consuming public is not discriminating, and we have got to educate the consumers of milk with reference to this point before we can make any appreciable improvement to speak of.

Dr. Reynolds referred to a case with which I am familiar—that in Minneapolis, where a large enterprise went to pieces because the public did not realize the advantage which would come from a pure milk supply, and in consequence of which was not willing to pay a few cents extra which it was necessary to pay in order to get the benefit of that pure product. In my own town we had several cases of that sort, where the very best people refused to pay one cent extra for milk which was taken under improved conditions, and when intelligent men and women, and particularly the latter, because it is the women of the household that are more responsible for that than anyone else—when the women of the households are unable to appreciate the difference in the quality of milk supplies and refuse to pay one or two cents per quart more for the milk which has been secured under clean, wholesome conditions—why, the question is wellnigh hopeless, unless we can bring about some improvement through educational means. I am not discouraged at the situation. I believe it is only necessary to continue the agitation which is already going on in order to change public sentiment so that the time will

soon come when people will be willing to pay the slight increased cost which is necessary in order to get the right kind of a product. Much is already being done through the medium of bulletins, and through the medium of the public press. These things in time are going to bring about a revolution along that line, so that the mothers and the directors of the household will come to a realization, sooner or later, that they have got to increase the price which they are willing to pay for this most valuable food product that we have, and when the dairyman can increase the price from one to two cents a quart on his supply it will go a long way towards encouraging him to keep the standard of that supply high.

Now, if a pure wholesome supply can be produced for a cent or two per quart beyond what it now costs to produce, it would certainly be a long step in advance. I believe if the veterinarians of this country were to institute a propaganda along these educational lines, backed up by other forces, the public would very soon come to a realization of what ought to be done, and would be willing to pay this very small increase.

I thank you for your attention.

A DOCTOR lately gave up his house, and was succeeded in it by a veterinary surgeon. Before he had been many weeks in his new home, the "vet." was knocked up in the early hours of a rather bleak spring morning. Opening the window, he heard a voice call out of the darkness:

"Can you come with me at once, mister? She's very bad."

The surgeon dressed and found a trap waiting to take him to a farm two or three miles away from the village. On the way he asked a few questions about the case he was to attend.

"I'm afraid there's very little hope for her," said the farmer. "She's been ailing now, you see, for ten years, and she's getting pretty old as well."

Annoyed at being called out at such an hour to see an obviously not very ill animal, the veterinary surgeon exclaimed: "Why on earth don't you shoot her?"

"What!" exclaimed the farmer, "shoot my mother!"

Then the "vet." understood that it was the previous tenant who was wanted.—*Farmers' Advocate.*

A STUDY OF A SERIOUS ANEMIC DISEASE AMONG HORSES.*

BY WINFRED B. MACK, D. V. M., UNIVERSITY OF NEVADA.

About two years ago the writer was informed that in one of the principal breeding districts of Eastern Nevada horses were dying in large numbers from some undetermined disease. The reports seemingly indicated an outbreak of infectious pneumonia and the affected valleys were visited with the intention of making some little study of the etiology and morbid anatomy of that disease. Arriving there, we found a condition with which we were altogether unfamiliar and were obliged to admit that fact. This malady is not described in any text-book with which we are familiar and we were not at the time cognizant of anything in current literature bearing upon it.

The disease appeared in the district in question in June 1906. A considerable number of animals succumbed to it. It abated as cold weather approached, but reappeared the next summer with equal virulence. The 1907 outbreak lasted well into the winter. On twelve or fifteen ranches the mortality amounted to from 125 to 150 horses. In 1908 there were but a few scattering cases and thus far this year there have been but few. There is a history of the loss of horses in the same neighborhood at intervals during the past fifteen or twenty years from what the ranchmen believe to be the same disease, except that previous to 1906 the loss was confined to animals pastured in the mountains. However, there has never been any systematic study of those outbreaks and there are not sufficient data to warrant the assumption that they were identical with this one. The horse-owners have assumed that those losses were due to plant or mineral poisoning and have borne them in the belief that there was no relief. They

* Presented at the nineteenth annual meeting of the New York State Veterinary Medical Society, at Ithaca, N. Y., August 25, 26 and 27, 1909.

seemed to be a necessary part of the horse-breeding business. From what we can learn of the symptoms in outbreaks of former years it is possible that this disease has existed there for a long time. When in 1906 the malady extended to the valleys and exterminated several scores of horses in a brief time it created considerable alarm. While the past two years have been comparatively free from it yet the disease is liable at any time to again assume large proportions, and it constitutes, in our opinion, the greatest menace to horse-breeding in that part of Nevada. The major portion of our time for nearly two years has been devoted to a study of this malady and some of the results of that work are perhaps worthy of presentation.

The disease is characterized clinically by marked febrile, cardiac, respiratory and locomotor disturbances, progressive anemia, edema, rapid emaciation, profound prostration, and, in the last stages, by capillary hemorrhages. In advanced stages there is albuminuria, but examinations earlier in the course of the disease have proven negative. It appears to divide naturally into three types—acute, sub-acute, and chronic. The three types, while distinct, are separated by no hard and fast line, and it is often difficult to classify a case. They may all be represented in an outbreak on the same ranch. The most acute type seldom, if ever, becomes chronic but the sub-acute or the chronic types may become acute at any time, and the terminal symptoms are nearly always acute. The symptoms vary according to the type presented, but they are sufficiently uniform to identify the malady in most cases.

The acute type manifests itself rather suddenly. One notices at first dullness, followed by dejection, prostration and high fever. The heart action becomes rapid and violent. Each cardiac contraction is followed by marked venous (jugular) regurgitation. The arterial pulse is soft and compressible. The impact of the heart against the chest wall becomes notable. There are occasional exceptions where the heart is very weak. The temperature is high, 105° to 107° F. In some cases the fever will be

continuous; in others it is remittent. The remissions occur irregularly; changes of four or five degrees may occur within a few hours. During these remissions the patient appears to be much improved, but they are invariably followed by a return of acute symptoms. There is functional respiratory disturbance, the breathing becoming rapid and labored, although no pulmonary changes sufficient in extent to account for it can be demonstrated either clinically or on autopsy. There may be edema of the dependant parts of the body, although this condition is not at all constant, and enlargement of the lymphatic glands. Rarely the legs are swollen. The visible mucosæ are at first congested and deeply reddened; as the disease progresses they lose their reddish color and assume a peculiar yellowish appearance. The veins in the conjunctiva are engorged and the mucous membrane appears as though oil had been introduced into the conjunctival sac. Emaciation is rapid. The patient becomes very weak particularly in the hind legs. He staggers when he walks, and one animal was observed to fall to the ground. Blood, or blood-stained watery fluid, drops slowly from one or both nostrils. Other than this there is no nasal discharge. The feces are coated with a brownish slime and are frequently stained with blood. Prostration becomes profound. The slightest exertion provokes severe dyspnoea and palpitation of the heart. During the periods of high fever the patient may eat but little, but at other times he consumes large quantities of food. Even when the temperature ranges high the appetite is not interfered with to such an extent as is usual in diseases characterized by high fever. This constitutes one of the most remarkable features of the malady. If the result is promptly fatal, say in about five or seven days, the blood changes may appear insignificant, but if the duration is longer one finds a notable decrease in the percentage of hemoglobin and in the number of red corpuscles. The number of leucocytes generally remains about normal. There is likely to be a relative lymphocytosis with a corresponding decrease in the percentage of polynuclears. The duration is usually but a few days and the termination fatal.

The following cases serve to illustrate this type of the disease and form the basis for the generalizations given above:

Case No. 11. November 16, 1907.

Patient a five-year-old Cleveland bay gelding, noticed ill that day for the first time. On our arrival at the ranch we found his respirations 14, pulse 50, temperature 104.6° F. His heart action was very forceful. He groaned frequently as though in pain. His attitude and facial expression indicated grave depression. The next day these symptoms had in no way abated; there was, in addition, inappetence and swelling of the hind legs below the hocks. November 22 the patient was much dejected, and we noticed blood dropping slowly from one nostril; the next morning from the other; the succeeding evening blood trickled slowly from both. The slightest exertion provoked severe dyspnoea and palpitation of the heart. The animal had lost flesh rapidly. He consumed considerable food, although his appetite could not be considered good. The feces were streaked with blood. The mucous membranes were congested and deeply reddened with a marked yellowish discoloration; the conjunctiva appeared as though oil had been introduced beneath the eyelid and the veins were engorged. No count of the blood corpuscles was made. A differential count of leucocytes, made November 17, showed lymphocytes 40.5 per cent., large mononuclears 1.0 per cent., polynuclears 57.1 per cent., eosinophiles 0.8 per cent., and mast cells 0.6 per cent. No subsequent blood examinations were made.

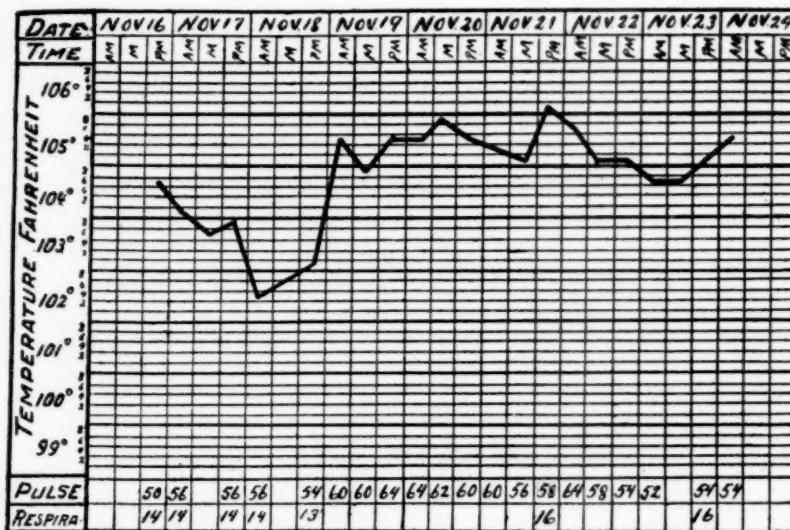
To this case we applied the most vigorous, energetic treatment and the best care that we could devise, but we were unable to effect any abatement of the febrile symptoms. We left the animal in the owner's care November 24, when these observations were terminated. He died November 28. An employee at the ranch examined him post-mortem and sent certain tissues to the laboratory. He reported his findings as follows:

"There were small red spots from the size of a pinhead to that of a small pea all through the intestines. The heart was covered with spots (hemorrhages); the fluid around the heart

resembled bile in color. The lungs were dark and covered with red blotches. The kidneys were enlarged and spongy, covered with red spots."

From the tissues received at the laboratory there was isolated a colon bacillus. This organism possessed sufficient pathogenesis to kill rabbits and guinea pigs promptly when injected subcutaneously and was used to inoculate three horses in an effort to determine the cause of the malady. The histological changes were those usually found in acute cases.

The following chart presents graphically the temperature, respiration and pulse observations made during our stay at the ranch with this animal, and the temperature curve illustrates an almost continuous type of fever:



Respiration, Pulse and Temperature Chart.

Case No. 16. August 29, 1908.

Patient a four-year-old roan gelding, broken to the saddle, but had done practically no work. Was never a very sturdy animal, but always considered rather delicate. Had been on the range during the spring and summer, until August 19, when he

was brought to a field near the house. The owner stated that when he was brought to the field the horse appeared to be in good health, supporting his opinion with the offer to buy made by a horse-dealer who visited the ranch about that time and in whose astuteness he had much confidence. August 23 this animal appeared ill. August 29 and 30 he was examined by the writer and presented the following symptoms:

The animal was in fair flesh, but, according to the owner, had lost rapidly during his illness. His appetite was good. He stood with arched back, head held low and ears drooping, his facial expression anxious and dejected. His coat was staring, the hair dry, rough and harsh. His hind feet were well advanced, his flanks tucked up. He was constantly shifting his weight from one foot to the other, apparently unable to endure his position for more than a minute or so at a time. Bloody, serous fluid dripped slowly from both nostrils. The pupils were dilated; there was a tense, strained, glassy expression to the eyes. The ears and legs were cold. The animal was extremely weak; in moving it was with difficulty that his feet were advanced; he was unable to lift them, but shuffled or dragged them along the ground; his legs trembled; he staggered as he walked. It was with the greatest difficulty he could be forced to back. There was moderate edema of the prepuce and of the abdominal wall anterior to it. There was no edema of the eyelids, no glandular enlargements could be detected. This was a spirited, nervous animal, difficult to approach or handle when in health. He submitted to free handling during our examination, except that he exhibited some nervousness when we were at work about his head. The visible mucosæ were a yellowish red, the blood vessels in the conjunctiva and nasal mucosa much engorged. Respiration was somewhat labored. Cardiac action was forcible, becoming violent after slight exertion. The pulse was soft and irregular. Auscultation and percussion of the thorax revealed no pulmonary changes; the cardiac sounds were arrhythmic, louder than normal, with the two sounds confounded. There were no cardiac murmurs. August 29, about 7 o'clock p. m., the respirations were

20, pulse 84, and temperature 104.5° F. The next morning the respirations were 16 and pulse 78, and the temperature had fallen to 100.7° F. The blood showed on examination hemoglobin 64 per cent. by Gower's method of estimation, red corpuscles 7,300,000, and leucocytes 6,000 per c.m.m. The urine was acid in reaction, its specific gravity 1,020, gave a negative test for sugar by Fehling's method, a positive reaction for albumin with Millard-Roberts' reagent, and, according to Esbach's albuminometer, contained two grams of albumin per liter. At 12.30 o'clock p. m., August 30 we drew a small amount of blood from the jugular for experimental study. The animal was then led to a meadow near the house and at once lay down. About 1.45 o'clock p. m. we went to the field where he lay and found him struggling convulsively, insensible to our efforts to attract his attention either by word or touch. His respirations were 44, pulse 140 and temperature 105.4° F. We left him; returning in from thirty to forty-five minutes, we found him dead with rigor mortis already well established.

The sub-acute type may be ushered in by symptoms much like the acute, only less pronounced, or it may have a more insidious onset. In certain cases one may find an animal greatly dejected, with high temperature and symptoms much like those described above. In other instances the first symptom noted may be sudden weariness, profuse sweating and shortness of breath, the animal tiring easily while at work. He may show a certain peculiarity of gait, a tendency to drag rather than to lift the hind feet.

This type is characterized by high, irregularly remittent fever, progressive anemia, rapid emaciation, prostration, cardiac weakness, dyspnoea, and edema. The temperature may rise as high as in the acute type, but the periods of remission are longer; it seldom returns to normal; sudden and rapid changes of several degrees are more frequently encountered than in the acute form. During the periods of high temperature the respiration increases in frequency and may be, at times, or when the patient is subjected to exercise, quite labored. The heart action is at all times rapid and forceful; in the febrile periods this increased cardiac

action becomes very notable; in the later stages of the disease as many as one hundred to one hundred and twenty-five contractions per minute have been noted; the cardiac impact against the chest wall becomes remarkably forcible. The arterial pulse is soft and compressible. Venous regurgitation follows each heart beat. Emaciation is rapid and profound, accompanied by marked loss of nervous and muscular energy. As the disease progresses the cardiac, respiratory, and locomotor difficulties become very pronounced and are aggravated by even the slightest exertion. The hindquarters especially are weak, the gait uncertain and staggering. There is usually extensive edema of the ventral portions of the body. The legs sometimes swell, but it is not the rule. The superficial lymphatic glands usually exhibit some enlargement. The appetite is voracious, except during the periods of high fever. At such times it may be considerably lessened, but during the remissions the animal will consume astonishing quantities of food. This ravenous appetite lasts usually until immediately before death. In spite of it the loss of flesh and strength continues. There is often, however, a decided gain in flesh during the remissions, but this gain is almost invariably lost during the next recurrence of acute symptoms. In this type of the malady the periods of remission are longer than in the acute; the patient may appear convalescent and hopes be entertained for his ultimate recovery.

This type is most characteristic; it is here that the picture of anemia is most vividly presented. The visible mucosæ gradually lose their normal color, their pallor increasing as the disease progresses, gradually acquiring a peculiar yellowish discoloration, probably due to the deposition in the tissues of blood pigment from the destroyed red corpuscles. In advanced cases this pallor becomes extreme; we have seen the oral, conjunctival, and genital mucosæ absolutely devoid of any red or pink color with the oral mucosa stained a pale lemon yellow. The veins of the conjunctiva are always engorged; the mucous membrane frequently appears as though oil had been introduced into the conjunctival sac. Anemia is always marked in this type. The percentage of hemo-

globin and the number of red corpuscles are gradually reduced until, as death approaches, they become but a fraction of the normal. Sometimes this destruction proceeds progressively until death. In other cases it may be arrested, and the condition of the blood return to normal or nearly so. At such times one is apt to think the patient is recovering. In nearly every case there is a return of the anemic condition after a variable period. Several cases have come under our observation where the number of red corpuscles fell to below 2,000,000; in one instance, we found but 980,000 per c.m.m. In uncomplicated cases there is little or no leucocytosis; there is relative lymphocytosis with corresponding polynuclear leucopenia. The duration of this type varies from a few weeks to several months. It usually ends in death. Recovery is more apparent than real. There are a few cases that have apparently recovered, but in view of the experience with others these animals are, in our opinion, likely to have a fatal relapse at any time. So far as we are able we shall keep them under observation, but this is not always possible; the owners sometimes dispose of them.

The following case reports are of interest at this point and serve to illustrate some of the general statements made:

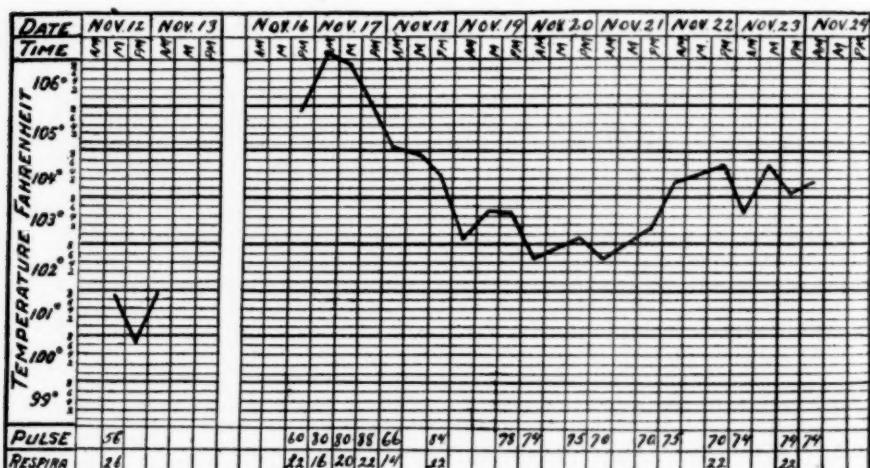
Case No. 8. November 12, 1907.

Patient an eight-year-old bay gelding. The owner stated that this horse had always possessed exceptional strength and endurance. He had been sick ten days when examined by us. The patient presented a dejected appearance. There was considerable edema of the prepuce and ventral portion of the body, which, according to the owner, appeared about three days previously. The visible mucosæ were about normal in appearance. The heart was very weak, its sound heard with difficulty, even with the aid of a stethoscope. There was a marked venous (jugular) pulse. His appetite was good. The feces were slightly stained with blood. His respirations were 26, pulse 56, temperature 100.6° F. The next day we left the ranch and returned Novem-

ber 16 at 5 o'clock p. m. On our return we found his respirations were 22, pulse 60, and temperature 105.8° F. The pulse was very weak, there was a pleuritic ridge and a pleuritic sound on the left side. The left lung was somewhat dull on percussion. November 17th appetite was failing, although he still ate considerable food. The ventral edema had increased. This animal passed with his feces on two or three occasions a considerable mass of grayish-white material, in appearance resembling washed fibrin. A microscopic examination of both teased preparations and sections showed it to consist of fibrin, tissue debris, both squamous and columnar epithelial cells and other cells with long, slender nuclei resembling fibro-blasts.

November 24th we left the ranch and our observations were discontinued. The patient at this time presented a sorry spectacle. The edema had increased materially, extending from the prepectoral region to the prepuce several inches in thickness. There was a large necrotic area on the breast where the animal rested against the manger. The left side of the neck, where the hypodermic needle had been used, was severely swollen, emphysematous in one place, and later, we are informed by the owner, extensive necrosis developed. The patient had become very weak, his legs trembled when he walked, and seemed scarcely able to support him. At one time we instructed an attendant to lead him from the stable for the purpose of observation and for exercise. He was fully five minutes getting over a threshold three or four inches in thickness. He appeared unable to lift his feet from the floor, and made several futile attempts to advance his forefeet over the threshold. Finally he succeeded in getting them across, and it was with interest that we watched him attempt many times to lift his hind feet over. At last he succeeded in dragging them across, and was much exhausted with the effort. In spite of such extreme weakness, he stood the greater part of the time. He had lost considerable flesh, although emaciation was not yet extreme. His eye was dull and his facial expression denoted great dejection. The visible mucosæ became

pale and exhibited a peculiar yellowish discoloration. The conjunctiva showed distended veins and presented an oily appearance in addition to the yellow color. Two or three times we noticed blood oozing from his nostrils. There was no other nasal discharge. The submaxillary lymphatic glands became somewhat enlarged. The pleuritic symptoms noted early in the disease soon subsided. The patient retained a fair appetite throughout all the time of his illness. The feces were frequently streaked with blood. During the entire period of our observations it was difficult to distinguish the cardiac sounds even with the stethoscope. The following chart presents in graphic form our respiration, pulse and temperature observations:



Respiration, Pulse and Temperature Chart.

November 28 the owner reported to us by letter that this horse appeared to be gaining. December 7 he reported its death and sent us some tissues by express.

Case No. 15. July 20, 1908.

Patient a three-year-old bay mare. About two weeks previous to our examination the owner of the animal noticed that she was thin, weak, and out of condition. She was removed

from the pasture to the stable, where the living conditions were good, and was given extra care and food. In spite of this attention, she continued to lose flesh and strength.

The food of this animal is worthy of note. The ranch is on high ground, close up to the mountains; is, in fact, about the highest tillable land adjacent to that particular one of the Ruby Mountains. Close to the stable there is an irrigated meadow of mixed alfalfa and timothy. The crop in 1908 was one of the finest we have ever observed. At the time of which we speak, mid-July, this grass was matured and ready for cutting. Better forage is not anywhere obtainable. This grass was cut and fed fresh to the patient several times each day. Ordinarily a horse will put on flesh rapidly with such food. At the time of our visit the mare had been receiving this food for two weeks, and we observed that she ate large quantities of it, and with apparent relish. Her appetite was, in fact, ravenous. Nevertheless, she was emaciated and hide-bound, her coat dry and rough, her appearance one of general unthriftiness. She resembled a half-starved animal that had wintered badly, such as one often sees in the spring in the hands of certain notoriously poor farmers, who habitually starve their stock. Her eye was bright, an unusual condition in this disease. All visible mucosæ were pale and yellowish. The conjunctiva had engorged blood vessels and the oily appearance noted above. There was some edema in the pectoral region. Auscultation and percussion of the thorax revealed nothing abnormal. There was a well-marked venous (jugular) pulse. The submaxillary lymphatic glands were somewhat enlarged. The feces appeared normal. Her respirations were 32, pulse 65 and temperature 102.7° F. An examination of her blood showed hemoglobin 50 per cent. by Gower's method of estimation, red corpuscles 4,200,000 and leucocytes 7,200 per c.m.m. Of them 46.4 per cent. were lymphocytes and 48.7 per cent. polynuclears.

We advised for this animal a continuation of the care and food she was receiving, with the addition of grain to her diet,

and prescribed what seemed logical treatment. August 1 the owner sent word to us that she began to improve at once and was then much better, was, in fact, "getting fat." In November another report reached us that she appeared to be "all right." January 30, 1909, she was again examined. She had a fair amount of flesh, her visible mucosæ were still somewhat pale, but improved in color; there was no edema, and she showed considerable spirit. The man who was sent to the field the day preceding our visit to bring her in for examination reported an hour's hard ride on horseback to secure her, and that after that amount of exertion she showed no fatigue. Her respirations were 10, pulse 44 and temperature 100.4° F. A blood examination showed hemoglobin 90 per cent. by Gower's method, red corpuscles 7,900,000, and leucocytes 11,800 per c.m.m.

The condition of the animal at the time of this examination would lead one to believe that she had made a complete recovery. She continued in this condition, according to the owner, until June 5, 1909, when suddenly she appeared to be acutely sick. We visited the ranch June 12 and found her in a critical condition. She had lost flesh rapidly, was very thin and extremely weak. Her respirations were 48, pulse 104 and temperature 102.3° F. She was lying down when these observations were made. The owner stated that she had spent the major portion of the time for two days in a recumbent position. The chest was resonant on percussion, the respiratory sounds normal except that they were somewhat louder than is usual in healthy horses. The heart was beating very forcefully. The two cardiac sounds were confounded; there were no murmurs. The mucous membrane in the eye and vulva was colorless; that in the mouth nearly so; the nasal was pale and yellowish. The veins in the conjunctiva were very prominent. She was uneasy, as though in pain. When told to arise she did so after considerable effort, but was very weak. Her hind feet were dragged along the ground about three-fourths the length of the step before lifting them. Her appetite had been good until within a day or two, since which time

she had eaten but little. In fact, she was too weak to graze. The muscles of the hips and thighs were much shrunken. The animal was markedly dejected. There was considerable sensory paralysis; she did not appear to feel the prick of a hypodermic needle used in administering medicine. A blood examination was made; the percentage of hemoglobin was 21 per cent. by Gower's method of estimation; there were 1,700,000 red corpuscles, and 5,000 leucocytes per c.m.m. A differential count of leucocytes showed 32.5 per cent. of lymphocytes, 1.1 per cent. of large mononuclears, 66.4 per cent. of polynuclears, and no eosinophiles or mast cells. The red corpuscles showed marked variation in size, many microcytes and megalocytes. In counting one thousand leucocytes, we observed 6 nucleated red corpuscles, 3 taking the basic stain, and one lymphocyte and one large mononuclear with a red corpuscle enclosed. The urine contained a trace of albumin.

June 14 this animal was again examined. Her respirations were 12, pulse 98, temperature 101.6° F. There was edema, slight beneath the thorax, extensive on the inner aspect of the thighs. The visible mucosæ had lost color considerably in two days and rapidly assumed a yellowish tinge. The submaxillary lymphatic glands were enlarged. The amount of flesh lost in two days was extraordinary. The owner stated that the animal was fat when she was taken ill, June 5; at this time she was extremely emaciated and gaunt. She was still able to arise and walk when bidden, but was so weak that we expected to see her fall.

June 16 we again saw this animal. Her general appearance was much improved. That morning she arose and began feeding, and in doing so walked about one-third of a mile. She had lost the tucked-up appearance in the flanks and was no thinner than two days before. The dejected look had disappeared. Her appearance would have led an inexperienced observer to believe that she would recover. The edema had practically disappeared. Her respirations were 18, pulse 92, temperature 102.6° F. A blood examination showed 23 per cent. of hemoglobin by Gower's

method of estimation, red corpuscles 980,000, and leucocytes 12,500 per c.m.m. Of the leucocytes 27.7 per cent. were lymphocytes, 2.0 per cent. large mononuclears, 70.3 per cent. polymorphonuclears, and no eosinophiles or mast cells. Megalocytes were numerous. In counting 1,000 leucocytes seven erythroblasts were observed. Since making the blood examination four days before the animal had received treatment intended to increase the number of leucocytes and the higher number was doubtless a response to that treatment. Whether the lower number of red corpuscles indicated destruction to that extent is somewhat doubtful; the lower count may have been due to the fact that the patient drank freely that morning for the first time in several days. Be that as it may the degree of anemia was extreme.

At this point we left the neighborhood, prescribing suitable (?) treatment, rather expecting, in spite of the serious condition the animal was in, to find her alive on our return a few days later. However, she died June 19. There was no autopsy.

Case No. 88.

Our personal observations on this animal were confined to three examinations—May 8, 1908, February 5, 1909, and April 27, 1909. He was a saddle horse, age not noted. The owner stated that the horse had the disease during the winter of 1907-08; that he had high temperature, cardiac, respiratory, and locomotor troubles, like other patients on his ranch that were studied by the writer. As this owner has had considerable experience with the disease and is a close observer of horses, his diagnosis is likely to be correct. When examined this animal was thin, unthrifty in appearance, his hair unshed in part, dry and harsh; the visible mucosæ were pale, with a slight yellowish discoloration. His respirations were 7, pulse 48, temperature 100.8° F. A blood examination showed hemoglobin 68 per cent. by Gower's method, red corpuscles 3,940,000, and leucocytes 5,500 per c.m.m. Of the leucocytes 66.7 per cent. were lymphocytes, 9.0 per cent. large mononuclears, 21.8 per cent. polymorphonuclears, 2.0 per cent. eosinophiles and 0.5 per cent. mast cells.

At the time of the second examination, February 5, 1909, the owner of this animal informed us that he appeared to recover during the summer, so that in the fall he was put to work, but that he tired easily and proved unable to work. He had been running down all winter. When we saw him he was very much emaciated, was hide-bound, with hair dry and harsh; dull and listless. The mucous membranes in the mouth and eye were *absolutely* devoid of pink or red color; that in the mouth was clear lemon yellow; the conjunctiva was a muddy yellow, appeared "oily," with injected veins. His heart action was very forceful. The lungs were slightly dull on percussion. The owner stated that in the sternal and abdominal regions edema appeared and disappeared. His respirations were 8, pulse 74, and temperature 103.2° F. The percentage of hemoglobin was reduced to 38, the number of red corpuscles to 2,120,000 per c.m.m. The leucocytes numbered 7,300 per c.m.m. Of these 28.7 per cent. were lymphocytes, 0.9 per cent. large mononuclears, 66.8 per cent. polynuclears, 2.8 per cent. eosinophiles, and 0.8 per cent. mast cells.

At the time of the third examination, April 27, 1909, this horse appeared much improved. There was a slightly pinkish tinge in the oral and conjunctival mucosæ. He had taken on more flesh, so that at a superficial glance he looked fairly well. His respirations were 18, pulse 56, and temperature 100.8° F. A close observation of the cardiac and respiratory functions, however, revealed impairment. The blood showed homoglobin 50 per cent. by Gower's method, red corpuscles 2,750,000, leucocytes 6,900 per c.m.m. Of the leucocytes 28.2 per cent. were lymphocytes, 2.9 per cent. large mononuclears, 65.6 per cent. polynuclears, 2.7 per cent. eosinophiles and 0.6 per cent. mast cells. There was no albuminuria.

It was our intention to keep this horse under observation for some time, as he will likely have a recurrence of the disease sooner or later. However, he continued to improve, so that about June 1 he was sold and has passed outside our field of observation.

The chronic type is characterized by a course of long duration, by occasional slight febrile attacks, a weakened heart, jugular pulse, and more or less loss of flesh and energy. The animal tires easily. He gradually loses condition until his coat becomes harsh and dry; he is hide-bound, and generally unthrifty in appearance. Anemia is not pronounced until late in the course of the disease. He may improve, for a time, under extra care, more nutritious food and tonic treatment, but a fatal termination is almost certain.

One frequently meets unthrifty, anemic horses, their condition due to a variety of causes, among which may be mentioned overwork, unhygienic surroundings, neglect, starvation, impaired nutrition, auto-intoxication, and intestinal parasitism. It is in the differentiation of the depraved conditions arising from such causes from the chronic type of the disease under consideration that the greatest difficulty in diagnosis is encountered. One may find in an unthrifty, hide-bound animal a considerable loss of energy, some anemia, pallid, icteric mucosæ, more or less cardiac weakness, slight venous regurgitation, possibly edema, with perhaps a moderate increase of temperature, but these symptoms are not sufficient for the differential diagnosis. In such conditions an examination of the blood affords considerable assistance. In uncomplicated cases of this disease there is usually little or no leucocytosis, but we do find a relative increase of lymphocytes, together with a corresponding decrease in the number of polynuclear leucocytes. A differential count of leucocytes is likewise an aid in reaching a conclusion regarding the presence of certain forms of intestinal parasites. While a determination of the percentages of the varieties of leucocytes present in the blood may afford little or no negative assistance in that connection, marked eosinophilia may be considered a strong presumptive indication of the presence in the body of certain helminths, as shown by Moore, Haring, and Cady,* who found a notable increase in the percentage of eosinophiles in the blood of horses

*Moore, Haring and Cady. The Clinical Examination of the Blood of the Horse and Its Value to the Veterinarian. *Proceed. Am. Vet. Med. Assn.*, 1904, p. 284.

infested with *Schlerastoma equinum*. We do not hold that a blood examination affords pathognomonic evidence, rather that it constitutes an important part of a rigid physical examination, and upon that basis we have excluded many cases.

In the examination of possible chronic cases the importance of exercise should not be overlooked. A few minutes' sharp exertion suffices to greatly accelerate the respiratory and cardiac functions in cases of this disease. Of course the blood for examination should be drawn before the animal is forced to exertion to avoid the resulting physiological leucocytosis.

In many of the chronic and sub-acute cases the appetite is ravenous; in some cases the quantity of food consumed is abnormal, the patient continuing to eat with relish until immediately preceding death.

The gross lesions found on autopsy are picturesque, especially in the acute cases. When the abdominal cavity is opened the picture is striking. The intestinal tract presents, on the serous side, a large number of small hemorrhages, particularly the posterior part of the small intestine, the cæcum and the large colon. These hemorrhages are, as a rule, from 0.2 to 1.0 cm. in diameter. They are irregular in outline, for the most part, with clearly defined margins. In most cases they are bright red in color. Similar areas, somewhat larger, are found throughout the mesentery. In chronic cases these hemorrhages may be comparatively slight in extent. The spleen is usually engorged, enlarged to two or more times its normal size. Its surface is thickly petechiated. The color when cut is dark, almost black. It is soft, so that the contents are easily squeezed out. The spleen resembles quite closely those found in cattle dead of Texas fever. In a few of the chronic cases examined the spleen was not engorged, but that appears to be the exception. The liver is engorged and dark. The kidneys are usually petechiated. The lymphatic glands in the mesentery, the meso-colon, meso-cæcum, and in the vicinity of the kidneys, spleen and cœliac axis are usually enlarged. Frequently some of them are surrounded by a considerable mass of

light yellow, jelly-like material. Many of them are hyperemic. The abdomen contains a few liters of blood-stained, serous fluid.

The pericardial fluid is increased in quantity, is blood-stained, and frequently dichroic. The heart invariably shows changes of considerable magnitude. It is enlarged, pale, and generally presents a parboiled appearance. On the pericardial surface one often finds small hemorrhages. They are most numerous in the white tissue corresponding to the septa. In the ventricles, particularly the left, there are hemorrhages beneath the endocardium. These hemorrhages are generally very extensive. Occasionally they are found in the auricles. Sometimes but one side, the left, is thus affected, at others it extends to both sides. Sometimes the valves are edematous and they may contain extravasated blood. The lungs are frequently hyperemic. There may be considerable extravasation beneath the pleura. Occasionally there are limited areas of consolidation in the lungs, but as a rule the pulmonary changes are slight, insufficient in extent to account for the profound respiratory disturbance found clinically. The thorax contains a liter or two of fluid similar to that found in the abdomen. The mediastinal lymphatic glands are frequently enlarged and may be hyperemic.

The bone marrow is invariably profoundly altered. In some of the long bones the yellow marrow is a very deep, dark red in color. This condition we have always found to be extensive in the femora, usually considerable in the humeri, and occasional in the radii and tibiae. It is rarely found in any of the bones below the carpal or tarsal regions. In the femora this change may involve from one-half to the entire amount of yellow marrow; in the humeri it will vary from a half or a third down to a few circumscribed areas; in the radii, tibiae or other long bones it consists of one or more small areas. Portions of the marrow of the epiphyses of the long bones, normally a light pink, are often the color of venous blood. The marrow in the flat and irregular bones, the ribs, vertebræ, scapulæ, pelvic, etc., is usually much darker than normal. We are unable, at present, to state

of just what this marrow change actually consists. It may be hemorrhage or it may be a resumption of the hematopoietic function on the part of the yellow marrow. We have sectioned and studied some of it, but are not yet able to interpret appearances to our satisfaction. This will constitute an important part of our work in the near future.

The skeletal muscles are pale. The subcutaneous and intermuscular connective tissue contains large numbers of small hemorrhages. The principal groups of lymphatic glands of the head, trunk and limbs may show enlargement and hyperemia. There are usually no gross lesions found in the central nervous system; in one case there was some extravasation at the base of the brain and the cerebral fluid was blood-stained. The laminæ have been examined in but a few cases; in each of them there was extravasation. The intestine frequently contains blood, sometimes in large quantities.

The following autopsy notes are of interest in this connection:

Case No. 3.

Died October 2, 1907, at 6 o'clock p. m. Autopsy October 3, at 8 o'clock a. m.

There was pronounced rigor mortis. Animal emaciated. Extreme edema of the prepuce; moderate edema of the subcutaneous tissue in the ventral thoracic and abdominal regions; some edema on the inner aspect of the thighs.

Beneath the serous covering of the intestinal tract there were thousands of small hemorrhages; the entire cæcum was involved, exhibiting hundreds of ecchymoses; the first and second portions and the posterior third of the third portion of the colon showed countless ecchymoses; the floating colon contained a few similar hemorrhagic areas; the areas of extravasation in the large intestine were from 0.2-1.0 cm. in diameter, bright red in color, irregular in outline, with well-defined margins. The anterior three feet of the small intestine exhibited numerous petechiæ,

0.1-0.2 cm. in diameter, somewhat darker in color than the hemorrhages of the large intestine, circular in outline, with clear-cut margins. As a rule, they were widely separated, but three or four groups of twelve to fifteen occurred, closely situated yet separated. The duodenal portion of the mesentery, the meso-colon, and the meso-caecum contained many ecchymoses, somewhat more diffuse than those in the intestinal wall, from 0.3-2.0 cm. in diameter.

There was a slight fibrinous adhesion between the liver and diaphragm. The liver was firm, the dorsal surface darkened, the ventral surface a dark greenish slate color. The cut surface of the liver showed marked biliary discoloration. The liver was filled with gas, so that from its incised surface the gas came out from the capillaries through the blood in minute bubbles in astonishing quantities. The spleen was increased in size and soft. The capsule was thickly sprinkled with minute hemorrhages. The cut surface was dark, almost black, the pulp soft, the fibrous framework indistinguishable. The kidneys were somewhat friable; their capsule easily removed; on section one could see several small hemorrhages about 1 mm. in diameter.

The thorax contained a liter or two of bloody serous fluid. The lungs were considerably congested and much firmer than normal, but did not appear to be pneumonic. There was a moderate amount of fibrinous exudate on the left thoracic wall and a slight adhesion between it and the left lung. On the median surface of the left lung there was hemorrhage beneath the pleura covering about one-half its surface. The right lung had sub-pleural hemorrhage over about two-thirds its surface. The pericardium was distended with dark, bloody, dichroic fluid. The heart appeared to be enlarged and presented a parboiled appearance. Beneath the pericardium there were numerous hemorrhages varying in size from punctiform to large diffuse ones. Beneath the endocardium of the left ventricle there was a deep, dark hemorrhage, covering approximately one-third the surface.

The crural lymphatic glands appeared normal; the sub-scapular group was somewhat congested; the inguinal, pre-scapular, and sub-maxillary groups appeared to be congested and edematous; the colic and renal groups, those about the ileo-cæcal valve and in the neighborhood of the celiac axis were edematous and hyperemic.

The marrow in the ribs, vertebræ and pelvis was much darker in color than is that in healthy horses. The marrow in the shafts of some of the long bones was a deep, dark red in color. This condition was marked in the humerus, intense in the femur.

The cerebral meninges were deeply congested.

Case No. 16.

Autopsy August 30, 1908, performed about one hour after death.

The carcass showed a fairly nourished condition with a moderate amount of fat. Illness had been of too short duration to effect any particular emaciation. There was subcutaneous edema in and about the prepuce and extending along the abdomen anteriorly, and anterior to the scapulæ. In the subcutaneous and inter-muscular connective tissue along the inferior half of the jugular furrows, along the dorsal region on both sides, anterior to the scapulæ, and beneath the latissimus dorsi muscle there were thousands of circular hemorrhages 0.1-0.2 cm. in diameter.

The intestinal tract presented a spectacular anatomical picture. Beneath the serous surface of the cæcum, the entire colon, and the anterior 18 inches of the floating colon, including the longitudinal bands along the large intestine, the entire mesentery, the meso-colon, and the meso-cæcum, there were countless thousands of bright red ecchymoses, varying in diameter from 0.05-0.5 cm., their outlines irregular, their margins clearly defined. There were similar hemorrhages along the entire small intestine, quite numerous anteriorly and increasing in numbers posteriorly until within about eight feet of the ileo-cæcal valve; in this posterior eight feet of the ileum they were the most numer-

ous; there was room for no more without their blending together; in fact, there were several areas of from one inch to eight or ten inches in length, extending over about three-fourths of the intestinal circumference in an irregular manner, diminishing and disappearing as the mesenteric attachment was approached, where the hemorrhage was suffused, resembling bright red paint carelessly and irregularly applied with a brush. The serous surface of the stomach appeared normal. The spleen was enlarged to fully three times its normal size, soft, and engorged; over its surface there were hundreds of bright red petechiæ; on the thicker end there was considerable fibrinous exudate, appearing as though it had been adherent to other viscera. On section the spleen was almost black in color, and of such consistency that the pulp and blood could readily be squeezed out of it. The liver was apparently enlarged and presented a peculiar greenish, dark mahogany color. About two-thirds of the pyloric portion of the gastric mucosa was densely hemorrhagic, with a considerable quantity of clotted blood adherent. The cardiac portion of the stomach appeared normal. There was considerable blood mixed with the stomach contents. The intestines contained a brownish slimy fluid. The entire intestinal mucosa from the pylorus to the middle of the floating colon showed numerous dark red punctæ, but much less numerous than were the hemorrhages on the serous surface. The ventral portion of the parietal peritoneum was extensively hemorrhagic, the areas varying in size from mere punctæ to large suffusions. The kidneys were soft and friable with extensive hemorrhages beneath the capsule; the cortex was pale with numerous minute, bright red points; the medulla dark and streaked with red.

The dorsal and left parietal pleura was considerably hemorrhagic; this was peculiar in that it was confined to that portion of the pleura covering the ribs, while the intercostal portions were not affected; these hemorrhages varied from the smallest punctiform to ecchymotic areas about 0.8 cm. in diameter. The lungs appeared normal, except for a few subpleural hemorrhages.

The heart appeared as though parboiled. Beneath the pericardium covering the adipose tissue corresponding to the septa were extensive hemorrhages; near the apex there was a considerable group of petechiae; on the walls of the ventricles there were large areas of diffuse hemorrhage. Beneath the left ventricular endocardium, covering about three-fifths of the surface, there was a thick, dark hemorrhage. The cardiac valves appeared normal. The fluid in the pericardial, pleural and peritoneal cavities appeared normal in both quantity and composition.

Many of the groups of lymphatic glands showed material alteration; the surface of the inguinal, prerural and popliteal groups and those situated along either side of the vertebral column were thickly sprinkled with minute punctiform hemorrhages; the splenic and renal groups were hyperemic and edematous, the mesenteric and mediastinal groups appeared hyperemic.

The bone marrow had undergone considerable alteration; that in the ribs, vertebræ, occipital, scapulæ and pelvis was of a much deeper color than is normal; that of the heads and condyles of the femur was very dark; in the yellow marrow of the radius there were numerous small, circular, dark red areas; the marrow in the tibia, matatarsus, and os pedis was diffusely reddened, while the dark red discoloration was intense in the marrow contained in the shafts of the femurs. There was hemorrhage into the laminæ of the hind feet.

The vessels of the cerebral pia were engorged; the spinal cord seemed normal. In the cæcum there were twelve schlerastomata; in the duodenum immediately beyond the pylorus there were one hundred or more larval cestridæ; besides these no parasites were found.

The histologic changes are about what would be expected from the clinical character of the disease. The liver shows extensive parenchymatous degeneration and necrosis. It is extensively pigmented. As a rule this pigment, consisting of fine yellow granules, is deposited in the hepatic cells. The capillaries are engorged with blood; the leucocytes may contain some pig-

ment granules. Occasionally one finds masses of this pigment in the capillaries, but it is, for the most part, intracellular. The kidneys contain hemorrhagic areas, some of them large. The renal tubules have undergone marked changes, parenchymatous degeneration and necrosis. The glomeruli are, as a general thing, but little altered. Occasionally there is some extravasation of blood into them. The spleen is engorged with blood, much of it disintegrated. There are large deposits of yellowish pigment in the spleen, derived from the red blood corpuscles.

The heart contains massive areas of extravasation beneath pericardium and endocardium and sometimes between the muscle fibers. The cardiac muscle frequently shows considerable cloudy swelling. The valves of the heart are sometimes edematous and may contain hemorrhagic areas. The lymphatic glands are hyperemic, frequently edematous. In some cases they are surrounded by an extensive mass of edematous tissue. The lungs may exhibit areas of catarrhal pneumonia with more or less edema of the interstitial tissue. There is often considerable extravasation of blood beneath the pleura. However, the pulmonary changes are never of sufficient extent to be of any particular clinical importance. The digestive tract shows extensive hemorrhages, sometimes some edematous infiltration; in one case there was mucoid degeneration of the epithelium in the colon. In one chronic case there was amyloid degeneration, extensive in the spleen, considerable in the liver. In another we found a beginning hyaline degeneration in the spleen.

There is no evidence that this affection is contagious by the ordinary contact of animals living together on the same ranch, but there is much in its nature to suggest a specific infectious disease. Considerable work has been done to determine that point, but the results are not yet of a decisive character. Bacteria have been demonstrated in the tissues of animals dead from it. Some of the cultures thus obtained were pathogenic for rabbits and guinea pigs. With one such culture three horses were inoculated. They were rendered desperately ill by that inoculation,

but the illness was not, apparently, the disease under discussion. An effort was then made to determine if the blood of patients was virulent for horses. Thus far three horses have been inoculated with serum or defibrinated blood and one has received blood per orum. One of these animals developed an unmistakably fatal case of the disease. Another one probably had it. The other does not, as yet (July 20, 1909), give any evidence of sickness. As a consequence the infectious nature of the disease is yet an open question. Until that question is settled it is impossible to decide whether or not this is identical with any other known malady.

LIST OF COMMITTEES APPOINTED BY PRESIDENT
MELVIN OF THE AMERICAN VETERINARY
MEDICAL ASSOCIATION.

A. V. M. A. COMMITTEES, 1909-10.

Executive—Joseph Hughes, Chairman; Tait Butler, John R. Mohler, John R. Mitchell, R. A. Archibald.

Intelligence and Education—David S. White, Chairman; S. J. J. Harger, W. H. Dalrymple, S. B. Nelson, Pierre A. Fish.

Diseases—V. A. Moore, Chairman; John R. Mohler, M. H. Reynolds, E. C. Schroeder, J. G. Rutherford.

Legislation—J. P. Turner, Chairman; W. G. Hollingworth, A. S. Cooley, T. E. Budd, W. H. Hoskins.

Finance—Otto G. Noack, Chairman; G. Ed. Leech, R. C. Moore.

Publication—C. J. Marshall, Chairman; R. W. Ellis, C. A. Cary, C. H. Stange, R. P. Lyman.

Necrology—J. F. Winchester, Chairman; William Dougherty, George H. Berns, Charles G. Lamb, J. L. Robertson.

Resolutions—A. H. Baker, Chairman; J. V. Newton, George H. Roberts, C. H. Jewell, F. Torrance.

Association of Faculties—S. Stewart, Chairman; F. A. Schoenleber, A. M. Farrington.

Association Seal—E. L. Quitman, Chairman; Seymour Hadwen, H. D. Gill.

FURTHER FACTS ABOUT RABIES.*

BY JOHN R. MOHLER, V.M.D., WASHINGTON, D. C.

TRANSMISSION OF THE DISEASE BY MILK AND MEAT.

While the virus of rabies is most frequently found in the central nervous system and the salivary glands, it may also be found in other glands and secretions, including the mammary glands and milk. That rabies may at times be excreted with the milk has been proved by Nocard, Perroncito, Bardach and the writer. In these latter experiments the milk of a rabid bitch having a litter of puppies was inoculated intramuscularly into rabbits and guinea pigs and produced typical rabies, but the puppies removed from the mother when the first symptoms developed were kept under observation for 18 months without developing the disease. The reason for these negative results in the puppies may be explained (1) by not having been bitten by the mother before she was removed, and (2) the absence of any abrasion in the alimentary tract through which the virus could have entered the circulation. It is a generally accepted fact that rabies cannot be transmitted to normal animals through food containing the virus of the disease unless lesions are present in the alimentary canal, but the conclusion that there is no danger to the consumer from the meat or milk of animals that are rabid is not tenable since abrasions of the lips, mouth and pharynx are all too frequent to permit of such risks. These products must therefore be considered as dangerous to health. One case is on record where a baby in Cuba developed rabies from nursing its mother while the latter was in the early stages of hydrophobia. In this case, however, the virus in the milk may have entered the circulation through abrasions of the gums during teething. Similar cases have been reported in veterinary practice where the virus of

* Supplement to paper published in AMERICAN VETERINARY REVIEW, October, 1909.

rabies was observed to have been passed to the offspring through the mother's milk, but in these cases it is impossible to eliminate an obscure bite from the bitch or lesions of the gums during this early age. While it is not probable that cattle would be milked after the symptoms of rabies developed, it is nevertheless important to realize the danger of using such milk and the necessity for preventing calves from sucking such diseased cows. All attempts to convey the disease to healthy dogs by feeding them upon meat from infected animals have given negative results.* Nevertheless the meat of rabid animals must be considered as unfit for food, and the meat inspection regulations enforced by the various countries having such inspection provide for the total condemnation of the carcasses of these animals. Infection has occurred in man from making autopsies on rabid dogs, and it is likewise possible to result if inoculation occurs while handling the meat of rabid cattle, hogs or sheep. Ostertag reports the case of a veterinary student at Copenhagen who infected a wound on his finger while making an autopsy on a dog dead of rabies, and died of the disease. Another somewhat similar case occurred in a veterinary student at Dresden in consequence of an injury received while holding a post mortem on a rabid dog. Wryszykowski in an attempt to discover the reason for the fact that no illness followed the eating of the meat and even the brain of rabid animals, tested the action of the gastric juice upon infectious material in vitro. Twenty-one rabbits were inoculated with this artificially digested virus but not one animal contracted the disease, while all the seventeen check rabbits which were inoculated with undigested rabies virus developed the disease and died. It is evident, therefore, that the gastric juice has a pronounced deleterious effect upon the virus of rabies.

PREVENTION AND ERADICATION.

Sanitary regulations which seek to control effectively the disease by exterminating it among dogs are most likely to prove suc-

* Claudio Fermi has recently produced rabies in rats and mice by feeding them rabietic material with their food. About sixty per cent. of the seventy animals so fed died of paralytic rabies.

cessful. There is no communicable disease which is more easily prevented or eradicated than rabies. Since the infection is practically always transmitted by a bite, and since the animal which does the biting is almost always a dog, all sanitary measures must be directed to the control of these animals for a sufficient time to cover the incubation period of the disease. It seems inexcusable therefore to allow this contagion to be propagated indefinitely, causing untold suffering to the affected animals and menacing the lives of persons, particularly children, who go upon the streets. The only measures necessary to obtain the desired result are (1) a tax or license for all dogs, with a fee of \$2 for males and \$5 for females, and the destruction of homeless or vagrant dogs; (2) restraint of all dogs which appear in public places, either by the use of a leash or an efficient muzzle. There is no doubt that neglect has allowed the accumulation of ownerless dogs in this country to an extent that renders our large cities frequently liable to incursions of rabid animals. To even mention muzzling, however, is sufficient to bring tirades of abuse upon the head of the sanitarian, and dog sentimentalists are immediately up in arms, using time, influence and money to prevent such an ordinance. In spite of the obloquy with which it is received by a certain mistaken class of the community, the results of muzzling amply justify its recommendation, and its rigid enforcement without any additional requirement, will exterminate rabies in a district in a shorter time than any other known method. Even Dulles, the great controversialist on rabies, admits that he considers muzzling to be the most important measure for limiting the ravages of this disorder, no matter on what theory it may be accounted for. Excellent examples of its efficiency are shown by the well-known results obtained in eradicating the disease from England, Sweden, Denmark, Berlin, and in other communities. The striking results obtained by England has caused many persons to propose and advocate a national dog muzzling law for the United States enforced by the Department of Agriculture. These suggestions, however, do not take into consideration the discrimination between the functions of the federal and state govern-

ments and the differences between the laws of the United States and those of England. The power transferred is not in all cases sufficient to effect the eradication of a disease for the reason that the federal government cannot enforce measures within a state without the legislative consent of the state unless the animals affected are subjects of or endanger interstate commerce. Its work, therefore, without the co-operation of the states affected, is limited to interstate traffic and quarantine lines are thus made to follow state lines. The department is always willing to co-operate so far as possible with any state which requests assistance in eradicating an infectious disease. But such a state must necessarily have the proper laws by which the control of the disease is made possible. When a disease such as rabies is confined within a state it does not come under the jurisdiction of the federal government and cannot be treated as the infectious diseases, pleuro-pneumonia and foot-and-mouth disease, which spread from state to state and become a serious menace to interstate traffic. The Department of Agriculture could quarantine against states where the disease exists, but it can readily be seen that owing to the great freedom of movement which dogs enjoy it would be impracticable to enforce such a quarantine further than to require all dogs to be muzzled which are being transported interstate by common carriers. Such a requirement would give an infinitesimal amount of protection as these dogs would be beyond our jurisdiction the moment they reached the state for which they were destined. If all states should enact muzzling laws, or if the state boards of health, state sanitary boards and municipal authorities in the infected states should be empowered to issue and enforce regulations compelling the muzzling of all dogs in the infected area and the impounding or humane destruction of all dogs found running at large, the disease would soon be stamped out.

The necessity for a muzzling order having arisen in the District of Columbia, the Secretary of Agriculture notified the District Commissioners of the presence of this disease in an alarming degree among the canines of Washington, and requested the enactment of a muzzling order. Such an order was deemed ad-

visible because the disease had suddenly jumped from 12 cases during the fiscal year of 1906-7 to 61 cases in 1907-8. The commissioners, however, believing that the most effective manner of dealing with the matter was to impound and destroy stray dogs, started to increase the dog-catching service on February 1, 1908, and from this time to June 15, 1908, there were 2,762 dogs impounded as compared with 1,185 dogs impounded during the corresponding period for 1907. Not until the President of the United States became interested in the subject did the Commissioners see fit to issue a muzzling order to be effective for a period of six months. With the extra wagons and force employed the number of dogs captured during the period of the muzzling order was 4,355 as compared with 2,794 captured during the corresponding period of the preceding year. The cost of the service for the period of the muzzling order was \$6,125, as compared with \$2,243 for the corresponding period in the previous year. To further the execution of this order 146 arrests were made and 134 convictions secured besides what was accomplished by giving notice of a penalty for violation. In 1908, during the last six months of which the muzzling order was enforced, 8,225 dogs were impounded, while since the muzzling order elapsed only 2,243 dogs have been impounded during the first half of this year. During the last six months of 1908, the period when muzzling was required, there were 46 cases of rabies, while in the first six months of 1909 there were only 28 cases. The results from the muzzling order were therefore becoming apparent and an additional six months' quarantine was requested by the Secretary of Agriculture, but this request was not complied with by the District Commissioners.

In order to secure state and municipal legislation for the control of rabies it will require concerted action on the part of all interested parties whether professional men or laymen to prove to the public the need, value and benefits of such a procedure. With such legislation properly enforced no dogs would be seen running at large without a muzzle. Those contracting the disease would

be unable to transfer the virus to other animals. Monetary loss, untold suffering and death among both human beings and animals caused by the disease would rapidly decrease, and in a relatively short period rabies would be eradicated from our country. After reaching this desired goal the reappearance of the disease could be readily prevented by a six months' quarantine of all dogs imported into the United States from countries where rabies is prevalent.

EFFECT OF MUSIC ON COWS.—A New Jersey farmer has discovered that music pays in the dairy business. He employed a Swiss milkmaid who yodeled, and the daily supply of milk increased. The milkmaid left, the cows, moped, and the milk supply decreased. He bought a phonograph and installed it in the stables, and when he put in the kind of music the cows liked they gave down freely. Some tunes made them dry up.—*Boston Journal*.

AN EXHIBIT AND LECTURE COURSE from Oct. 13th to 20th inclusive were given in the Lawrence City Hall, Lawrence, Mass., under the auspices of the Lawrence Anti-Tuberculosis League. The exhibit was composed of photographs, charts, models and specimens brought together from different parts of the country, illustrative of the methods now employed for the treatment of tuberculosis in hospitals, in sanatoria, and at home; and also of means for preventing the spread of tuberculosis from one person to another. Dr. John L. Winchester presided over one of the sections and delivered a masterly address. The work was entered into enthusiastically by physicians, clergymen, judges, lawyers and our own Winchester.

THE VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY will hold a reunion and smoker on Wednesday evening, December 1, and would like every veterinarian in Greater New York and vicinity to be present. Veterinarians, as a rule, do not mingle together enough, socially. It is a mistake; you can never know what a real good fellow your competitor is until you have met him socially. Write Dr. D. J. Mangan, No. 280 East One Hundred and Sixty-second street, City, for particulars and tickets.

REPORTS OF CASES.

TETANUS.*

By W. H. LYNCH, D. V. S., Portland, Maine.

In introducing to your notice the subject of tetanus, I feel an apology is due from me for asking you to consider so common a disease, one with whose clinical symptoms we are all so familiar—too familiar, probably, in the case of many of us; but I am prompted to do this, actually compelled, being notified by the worthy secretary of this association to write a paper for this meeting, and having a horse of my own that has recently been through this terribly painful and frequently fatal disease. I hope that to some extent, and in a great degree the discussion which may follow, will serve to bring to our minds some detail which, individually we may have overlooked or forgotten, so that at our parting this evening we may be conversant with the most recent theories as to the actual cause of tetanus, the manner in which the pathological conditions are produced, and the steps which may be taken to prevent altogether, or remedy as much as possible, such conditions.

If tetanus is not so common, if there are not certain species immune or only infected with difficulty, it is none the less of supreme interest to us, as the most valuable animal to the use of man, the horse is particularly susceptible to infection, even more so than man himself. Anything, therefore, if only a hypothesis, which can assist in pointing out the lines to be followed in successfully combating the disease must be carefully considered, and if necessary, tested. Much treatment is empirical, many of our most successful cases after treatment which could not be scientifically upheld; and careful consideration of such treatment will often indicate the way to a rational method. Out of darkness there is almost always sure to be light.

I do not propose in this short paper to discuss the symptoms of tetanus, but the treatment, as I found ample scope for all my activities once it had developed. Briefly I wish to discuss the

* Read before the Maine Veterinary Medical Association.

case, the means whereby the poison spreads, how its dissemination may be prevented and how neutralized out of the body and perhaps in the body itself. I believe we are agreed that its symptoms are characteristic. Time will not allow me to indicate the various opinions held, experiments made, work done on this subject. It would absorb all the time allowed me to simply begin with this.

Tetanus is the disease we recognize following the absorption of the tetanus toxin. Whether the toxin is formed by the germ of the disease in the body, or whether the toxin is obtained from the culture of the incubated organism and then injected in the body. The toxin operates upon the higher nerve centres, upon the nerve cells in the gray matter of brain and cord, or to be more accurate, upon the neurons and as a result, we observe the muscular contractions involving certain groups of muscles and portions of the body. The organism of tetanus is an anaerobe, oxygen is fatal to it, in its bacillary form, hence tetanus does not usually follow large surface wounds of no great depth, but rather small wounds of uncertain depth with recesses practically shut off from the air. It usually appears when a wound is cicatrizing and for probably the same reason that oxygen harmful to the development of the germ is shut off from the wound.

We do not know the incubative period of tetanus, because the disease is not recognized till the well known muscular contractions make their appearance. We are not able to say how long it is necessary for the organism to be in the wound before the symptoms appear. It is more than likely that the incubating period lies between wide limits and that it will vary with different animals. It is also probable that it will vary with the site of the wound and the distance from the nerve centers. The organism of tetanus remains near the wound which is always present. I consider the term "Idiopathic Tetanus" to be redundant since there is truly only traumatic tetanus, every case being due to infection from a wound though the wound may be so small that it cannot be discovered or may be in a region which cannot be examined. The organism has a wide distribution. It is found in the soil, in dust, in feces—of horses especially. It is a common saprophyte in the alimentary canal of animals. When one considers the number of intestinal animal parasites a horse may carry and the serious lesions which these parasites may produce in the mucous membrane of the gut, it is wonderful indeed that septicemia is not more common. If we do not discover that there is a wound we must remember that a wound is a solution of con-

tinuity which may be extremely small, and must not conclude that one does not exist.

Having gained entrance to a wound the tetanus organism accordingly may cause no harm or its presence may result in disease. We have already seen that the oxygen of the atmosphere is fatal to the organism but there are in the body potent factors which prevent any further development of the bacilli and these are the phagocytes. The phagocytes must, however, act promptly and without hindrance if the tetanus organisms are to be annihilated. Unfortunately this can rarely be the case. If the tetanus organism is to be rendered harmless it must be before it has produced any poison, as the poison is as fatal to the phagocyte as it is to the body of which they are a part and before the tetanus bacillus is ready to form the toxin, the phagocytes are too busy dealing with the product of the germ of the tetanus. Experiments have been made to elucidate the rôle played by the phagocytes and the organism of tetanus. If a quantity of tetanus bacilli is washed free of the toxin they form and is then injected into a susceptible animal the phagocytes will seize the bacilli and render them harmless or assimilate them and the animal would be harm-proof. If any substance that will keep the phagocytes in check is injected at the same time as the organisms, then tetanus will follow, owing to the organisms having free play to form the toxin.

Tetanus is then seen to be an intoxication produced by the tetanus bacillus and for its development the tetanus bacillus need not be present in the body, the toxin may be obtained from a culture and injected into the body. Experiments made at the Pasteur Institute showed that this toxin travels along the nerve trunks to the centres following the most direct route to reach the cell body of the neuron. This toxin is of great strength, two drops are sufficient to kill a horse with all the symptoms of a severe attack of tetanus, thus showing the toxin to be of great power, that it is formed at the wound, that it spreads by the nerve trunks, its direction being centripetal, that it is fixed or united with the nerve cells or cell bodies of the neurons.

Thus much by way of introduction, as you may imagine, I have not carried all this from my college days, but recently made extensive researches into all the history I could find of Tetanus, being impelled thereto, by urgent necessity of relieving the suffering of my driving horse who has lately recovered from an attack of tetanus of the greatest severity.

On the afternoon of Saturday, March 27, 1909, I hitched up

my five-year-old brown gelding to make a few calls. Returning home about five o'clock, my attention was drawn to his peculiar gait, which was very stiff and stilted. I came in the yard up to the stable door and saw plenty of signs of trouble as I took him out of the harness. His head and neck were stretched forward, tail more erect than usual and membrana nictitans slightly elevated—all sufficiently characteristic symptoms of tetanus, and yet as you may all imagine, I was unwilling to pronounce it, so I 'phoned to Dr. Lord, asking him to come in and take a look at him. He arrived in a short time and I listened to him confirming my diagnosis with a feeling you can probably guess. Dr. Lord said: "Tetanus, better begin injecting antitoxin." I telephoned the house where I am in the habit of buying my supplies to send me some Parke Davis Antitoxin, but all that could be found was four tubes veterinary and two tubes human use. Feeling apprehensive of lack of further opportunity I gave him an aloetic bolus, then fed him in my usual way with his regular ration which he managed to consume, although mastication was becoming more difficult all the while, and injected the antitoxin at intervals of four hours.

Sunday morning, March 28, I found complete trismus and other signs of well developed tetanus. I darkened his stall, fastened the doors leading immediately into his quarters, allowing no other than my own family to go near him. No more anti-tetanic serum to be found in the city. Fortunately at this juncture, Mr. Smith came to the rescue by kindly procuring me one dozen bottles of the Parke Davis serum from one of the jobbing houses here, which I continued to inject at intervals of four hours. I kept this up for several days and nights. I am unable to say how many, but I used altogether three and one-half dozen bottles.

Monday, March 29, I placed him in slings, believing that his strength was not equal to his remaining upright, and knowing that once he got down, it would be the end. He was having severe spasms that were becoming more frequent, finally they would take him off his feet and leave him dangling in the slings. April 3 I went to Skowhegan for the day, leaving him helpless in the slings with those spasms coming every ten or fifteen minutes, and each one seemingly about to end his existence. I hardly hoped to find him alive on my return and asked Dr. Lord to have another look at him, which he did and I am safe in saying he had few hopes of his recovery.

From Sunday, March 28, there began to be a very great amount of saliva coming from the incisive openings, of a fetid,

feverish odor. I considered this an indication for the use of phenol. He had become reconciled to the slings and I arranged his manger in such manner as to keep it sanitary with the free use of the phenol, syringing his mouth with phenol solution at times when I fed him with thin gruels which always had a drachm of phenol in them to each two quarts. Gruels for rectal injection were similarly compounded. I put phenol in his drinking water. I kept up the use of this agent for about ten days, hoping to have it act as an anti-ferment in the digestive tract and play an important part in combating the toxin. You will note that I used large amounts. There seems to be a special immunity in tetanus to strong agents, as probably the gamut has been run by doctors in hope of finding specific—Prussic acid, Cannabis Indica, Curare, etc. I have heard of trephining.

In the third week of his trismus, I changed his diet from thin gruels to eggs and milk, but kept up the gruels per rectum. For some time I had been giving the antitoxin twice daily only, as the convulsions had almost ceased. A noise or strange step would still bring them on. I believe that antitoxin saved this horse's life. He really had little else and the attack was of great severity. I must say I have never seen a worse case. If I ever have a similar one I will inject two ounces of the antitoxin every four hours instead of one, using this method for a shorter period, and recommend this procedure.

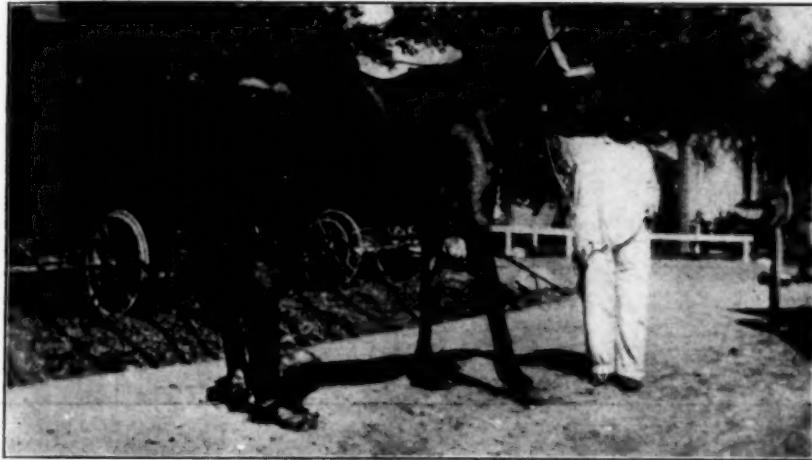
Just what the antitoxin does I do not know, but imagine it reinforces the phagocytes by being injected in the circulation.

Returning from the Association meeting April fifteenth, I found my horse with a few spears of hay in his mouth. From now on his jaws gradually unlocked, and generally showing signs of improvement, ears and tail less rigid. Stopped feeding gruels and eggs, and fed hay, oats and a mash of ground oats at night. On the night of May 1 he had a bad attack of tympanitis, from overfeeding there is little doubt, as he was very greedy, and I could not resist giving him what he wanted. I gave him all the regular remedies and they failed to relieve him, so was obliged to perform a colocentesis, which gave immediate relief, although I dreaded the effects of the wound. Fortunately it healed uneventfully. From now on little change, work of repair going on very slowly. Emaciated, weak, appetite strong, greedy in fact. May 29, exactly nine weeks from the attack, I put him in the harness and drove him to the blacksmith's and had him shod and gave him a short walking exercise every day. The eleventh week he reported for duty.

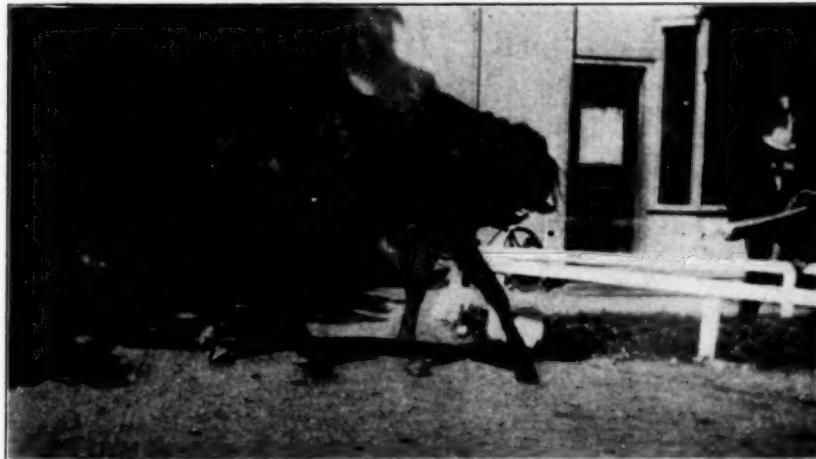
CLINICAL PICTURES.

By FRANK J. LOOMIS, D. V. M.

We are indebted to Dr. Frank J. Loomis, of Phoenix, N. Y., for the following set of pictures of cases presented at the clinic



of the New York State Veterinary Medical Society, at Utica, September, 1908. Dr. Loomis photographed the cases at the



clinic, but in some way overlooked sending them until after his return from the Chicago meeting of the A. V. M. A., one year later.

Nevertheless the cases will be recognized at once by anyone who saw them at the Utica meeting. Not so vividly the case of exuberant granulation represented by cut No. 1, as the four

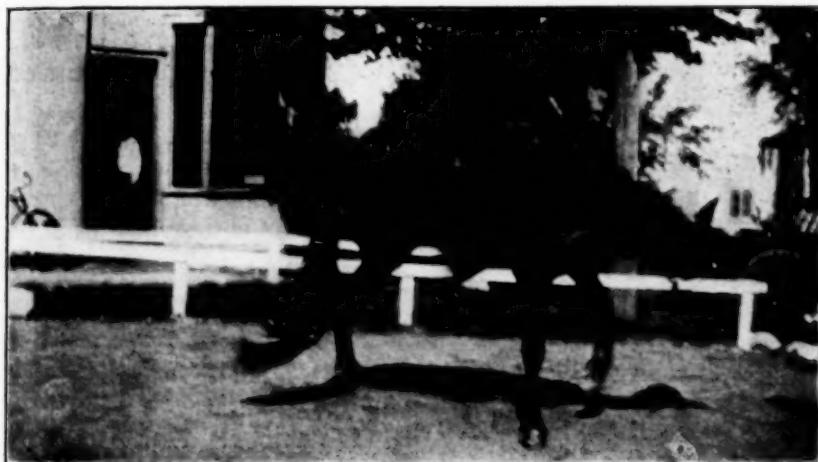


others representing a case of unusual interest that was presented for diagnosis and assigned to Dr. Geo. H. Berns.



Dr. Berns found the case of so much interest that he asked Drs. Grenside and Williams to consult with him. Dr. Williams was operating and could not give the case the attention it re-

quired to arrive at a diagnosis; but Drs. Berns and Grenside studied it carefully, and we refer our readers to the October,



Contractions at their height.

1908, issue of the REVIEW, for a description of the case and the diagnosis arrived at separately by these gentlemen.

RETENTION OF FOETUS IN A COW.

By J. A. McCrank, D. V. S., Plattsburgh, N. Y.

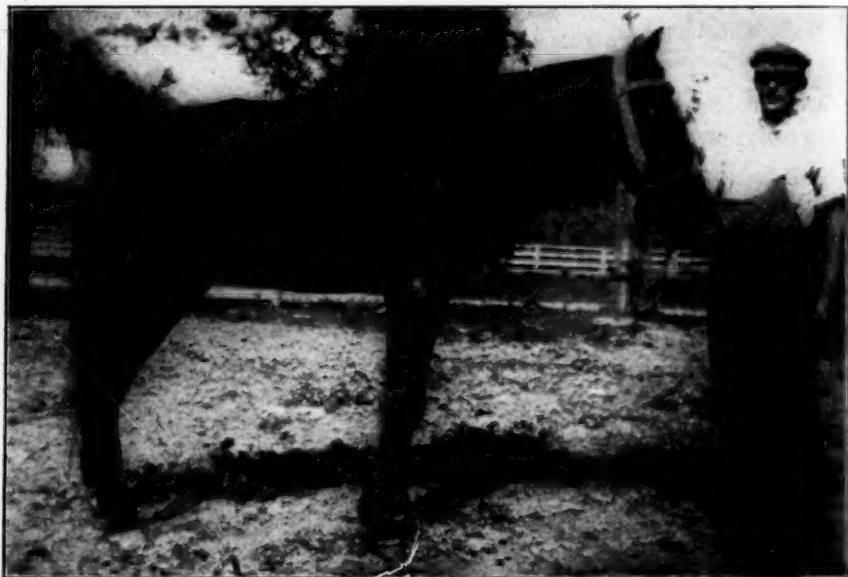
Mr. Goff had a cow due to drop a calf March 14, 1906. She showed so plainly that the period of gestation was about complete that she was watched night and day; soon all signs disappeared. She was milked and the flow was wonderfully good. She put on flesh and it was believed she was farrow. She never showed signs of heat. She was milked through 1906 and 1907. In April, 1908, I was called to examine her to see why she did not show periods of heat. I diagnosed a twist of neck of uterus and a calf in the uterus. She ceased milking about this time, and soon was in splendid beef condition. She was sold to the butcher and I was present when she was slaughtered. I found a foetus; a dry and firm mass wrapped in the dried foetal membranes. It seemed as if the mucous coat and cotyledons parted from the muscular coats of the uterus and became part of the encysted mass.

"CANNABIS INDICA AS A GENERAL ANÆSTHETIC."

By W. A. BOUCHER, V. S., Pasadena, Cal.

Where I have a major operation I use one drachm of cannabis in an ounce of sterile water injected into the jugular vein one hour before operating.

I operated on a cryptorchid the other day and the horse never made a struggle, not even when severing the cord. As soon as he was loosened he regained his feet without the least trouble, went wandering around the corral and was eating hay in a few minutes. I also use it in this same manner in severe cases of colic. I have never had a bad result from its use.



Kyphosis (Congenital). Photo by G. E. Corwin, Jr., D.V.S., Canaan, Conn.

The above photograph, by G. E. Corwin, Jr., D. V. S., of Canaan, Conn., is of a mare, whom the doctor describes as having Congenital Kyphosis.

DELAYED PARTURITION.

By J. A. McCrank, D. V. S., Plattsburgh, N. Y.

On July 19 Mr. Martin drove his mare to my infirmary for examination. History—This mare had been due to foal on May 11. All signs of approaching parturition were evident. She was kept at work. About June 1 the abdominal expansion diminished, udder reduced, yet health and condition continued excellent. About July 14 she began to void urine quite often, health became delicate and pus began to drip from vulva. On examination I found the scapula in the urinary passage, and farther on, held by the uterine walls was the foetus, in a terrible state of decomposition. By means of enemas of warm water, etc., I removed this foetus in two hours. She was exhausted. I clothed her warmly, gave stimulants; did not know the wonderful properties of Echinacea then. Next morning she took a light breakfast; in eight days she was returned home and to her work. At no time did this mare show signs of labor, never was sick, never missed a feed nor a day's work.

AT the Horse Show in connection with the New Jersey Fair, at Olympic Park, N. J., in the middle of October, Dr. H. Vander Roest, Newark, N. J., officiated as veterinarian and judge.

THE NATIONAL HORSE SHOW will open in Madison Square Garden, New York City, on November 8 to continue until the close of the 13th. The prospects are bright for one of the best shows that has been held in some time. The horse is gradually and surely regaining his foothold with the solid and sane people of the world.

DR. H. B. ATKINSON, of Embro, Ontario, Canada, in renewing his subscription to the REVIEW, under date of October 16, writes that he has just completed the building of a fine brick veterinary hospital 30x50, as his practice is growing to such an extent that he is forced to enlarge his quarters. The doctor says he "does not want to miss a single number of the REVIEW." That *may* account for his prosperity.

ARMY VETERINARY DEPARTMENT.

FIRST ACTION ON THE ARMY VETERINARY BILL.

For the information of the army veterinarians a brief report is herewith made of what has been done so far for the pending army veterinary bills.

At the meeting of the American Veterinary Medical Association at Chicago, the chairman of the legislative committee made a brief report, stating that no strong attempt had been made to have the army veterinary bill passed during the last session of Congress, as there was practically no military legislation considered; that the War Department had reintroduced the old veterinary bill in the House, and a new, briefer and somewhat altered bill into the Senate, the text of both of which was given in June (see pages 119-122, *AMERICAN VETERINARY REVIEW*, October, 1909). He concluded with the remarks, "that the only army veterinarian who remains physically disqualified has less than ten years of service, so that the bill seems unjust, and unless the disability amendment favored by a former Secretary of War is added to these bills, the committee will antagonize them during the next session of Congress. Further the legislative committee believes that it will be a long time before Congress will again consider any general reorganization of the army, hence those veterinarians who are building their hopes on new and better legislation, must have plenty of patience. That, therefore, it seems better to urge the adoption of the present bills if properly amended, as they will contain clauses covering retirement for age and disability which seem to be the paramount issues at present."

Through the effort of Dr. Chas. H. Jewell, Fort Riley, Kansas, the legislative committee was persuaded to have the bill so amended as to provide retirement for *all* physically disabled *with no time limit*, and the Association passed a resolution to the same effect. It was ascertained, however, that the Association feels that as long as the army veterinarians are not united on what they want, it can take no very decisive stand, and the idea seems to develop that it will be finally up to the Association, as a body, to draft a suitable bill if the present bill should fail again of passage.

All this is very good. We thank the chairman of the legislative committee for the firm and just stand taken about the disability clause, even if only one of us remains disabled, which we hope is true; and we thank Dr. Jewell for his work with the Association while at Chicago. There really seems to be no further need of discussing the merits or demerits of the bills reintroduced by the War Department, which have been gone over thoroughly and to satisfy the most sceptic during the last four years. As we have now two War Department bills, all that remains for us to agree upon is the choice of *the* bill. I for one favor the Senate bill, because it is briefer, which is always an advantage when legislation is considered in the military committees and on the floor of the Senate and House. The chairman of the legislative committee is anxious to have the views of the army veterinarians on which bill he may proceed to work, and we request that all army veterinarians send us a brief note what their choice is. We shall then summarize the replies and forward the result to the chairman of the legislative committee with instruction. Please write either to Dr. Chas. H. Jewell, Fort Riley, Kansas, or to the undersigned.

OLAF SCHWARZKOPF,
Fort Sam Houston, Texas.

ARMY VETERINARY NOTES.

Dr. Gerald E. Griffin, 3d Field Artillery, has contributed an article in the *Journal of the U. S. Cavalry Association* for September, describing in his vivacious style the army farrier of the olden days and the new farrier as he emerges a graduate of the Farriers' School at Fort Riley. All that the doctor says is to the point, and will help to keep the merits of this school in which several of our army colleagues act as efficient instructors, before the minds of officers of the mounted arms. The article was evidently so interesting that it was honored by a reprint in full in the *Army and Navy Register* of October 9, 1909.

AN OMISSION.—There were omitted in the AMERICAN VETERINARY REVIEW of September, in my contribution about the Army Veterinary Bill (page 716) the names of Drs. Fraser, Gage, Jewell, Sproule and Willyoung, who were appointed to the army on January 24, 1903, and who would, therefore, come up for examination for promotion on January 24, 1913, under the provisions of the bill now pending.

O. S.

CORRESPONDENCE.

WASHINGTON, D. C., October 17, 1909.

Editors AMERICAN VETERINARY REVIEW:

Inasmuch as there was considerable misunderstanding among Army Veterinarians as to the status given on board army transports under General Orders No. 147, the legislative committee of the A. V. M. A. was requested to get a proper interpretation of the same.

Dr. Mohler and I called on the proper authorities at the War Department on October 16, 1909, and were informed that General Orders No. 147 did not apply to the veterinarians in the U. S. cavalry and artillery, as these veterinarians are considered as officers and are given quarters and mess facilities as such, and whether traveling with troops or not, are entitled to travel first-class.

General Orders No. 147 applies to only one veterinarian, who is employed on the animal transport "Dix."

Very respectfully,

J. P. TURNER, V. M. D.,

Chairman Legislative Committee, A. V. M. A.

THE place of the 1910 meeting has not yet been definitely settled upon; but the dial of the A. V. M. A. compass seems to be fluttering in the direction of "The Golden West."

IN the paper on "The Transmission of Avian Tuberculosis to Mammals," by Drs. John R. Mohler and Henry J. Washburn, presented at the recent International Veterinary Congress at The Hague, the two most valuable points brought out were the demonstration of tubercle bacilli in the eggs of tuberculous hens and transmission of the disease to hogs fed upon such fowls. We shall either publish the paper in full, or the essence of it as abstracted by Dr. Mohler, in a subsequent issue of the REVIEW.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

A CASE OF RUPTURED BLADDER [A. F. D.]—A seven-year-old mare has violent colic. Chloral relieves her. Attempts to draw urine fail. After an hour she gets more chloral as her pains have returned and become very violent. During the periods of quietness she laid on her back and during the violent stages of pains she rushed round her box. She died after four hours of suffering. At post mortem there was found a large intestine inflamed and distended. The contents being of a darkish red color. The bladder had a rupture, one inch long and situated in the upper anterior surface of the organ.—(*Veterin. Record.*)

CYSTIC CALCULI IN A BITCH [J. C. S. Powell, M. R. C. V. S.]—Six or seven-year-old fox terrier bitch had presented symptoms which left no doubt as to the nature of her ailment and examination made of her condition confirmed it. She had cystic calculi. A large mass had been felt in the abdomen, in front of the pubis, which had been detected as formed by two stones which could be felt rubbing against each other. Operation for their removal was decided and careful antiseptic measures taken. The abdomen was opened, and the bladder, large and distended, was exposed. The walls of the bladder were much thickened. They were incised and the bladder being open, the stones were removed. The organ was carefully swabbed out and seven Lembert sutures inserted close together. The abdominal wound was closed and dressed in the usual way. The animal seemed to do well, passing urine naturally and taking light nourishment, when on the third day after the operation she was taken with vomiting. She grew rapidly worse and died on the same day. On opening the abdomen, it was found that the urine had escaped in the peritoneal cavity through a little opening that existed between the last su-

ture at one end and the end of the wound of the bladder itself. The Lambert suture ought to have been continued some distance beyond the wound.—(*Veter. News.*)

MALFORMATION IN A CHINESE CALF [*Adam Gibson, M. R. C. V. S.*].—This is the description of post-mortem condition found at the slaughter of three calves which during life had the vulva down almost between the thighs. The uterus and appendages were normal. The vagina at the os uteri was of normal caliber and readily admitted the introduction of two fingers. But backwards, where it ought to have opened at the vulva, it only admitted an ordinary lead pencil with difficulty. The external orifice at the vulva was very small. The bladder was normal. The urethra of normal diameter and continued backwards and downwards like the vagina. It opened about half an inch inside the vaginal outlet into the vagina, just at the base of the free portion of the clitoris. This arose from the symphysis and was continued down to the vulva. Its extremity was free for about three-quarters of an inch and would just be seen protruding from the vulva, when the animal stood up. During micturition the clitoris was protruding about one-half an inch.—(*Veterin. Record.*)

DEATH DUE TO TAENIA SERRATA [*A. W. Noel Pillers*].—A fox terrier, 11 months old, said to have had distemper, was sold with the information that he was passing segments of tape worms and would require a dose of warm medicine. A dose of tenatine was given. From this day the dog grew sick. He ate poorly, had normal pulse and temperature; there was slight vomiting. On the fourth day breathing was very labored, accompanied by grunting. Then came general weakness and complete anorexia, constant vomiting and raising of the temperature to 104° F. For a day or two he seems to do a little better, then he had eructations of a dirty brown liquid. He dragged on for several days and finally collapse came on and he died after an illness of eleven days. The treatment had consisted of meat suppositories, Vichy water and milk with the administration of cyllin, sub-nitrate of bismuth, hydrocyanic acid diluted, etc. All the organs appeared healthy except the stomach which contained a dirty brown colored fluid similar to that which was vomited and in it a ball of taenias, fully the size of a tangerine orange. The worms were *Taenia Serrata*.—(*Veter. News.*)

PROLAPSUS OF THE OMENTUM AFTER CASTRATION WITH A CURIOUS SYMPTOM [*Henry Taylor, F. R. C. V. S.*].—A colt was castrated by the actual cauterization method. Nothing out of the way occurred during the operation, except that the veins of one cord being very varicose, care had to be taken. On the evening of the fourth day, a piece of omentum hung out of the scrotal wound, on the side of that varicosity. This omentum was dark, swollen, edematous and had its blood vessels gorged with blood. It was gently pulled out, disinfected, as was also the scrotum, a ligature was then applied as far up as possible, amputation below the ligature was made and the stump returned gradually in the abdomen. The next day appeared the alarming symptom referred to in the heading. The colt seemed distressed and anxious; but the chief thing observed was extremely loud sounds heard through the intestines. These could be heard ten yards distant and might be likened to the forcing of a mixture of gas and fluid through a constricted portion of a flexible tube. They were not constant, but occurred every minute or so. Apparently the omentum had by some way or another lessened the normal diameter of the intestinal tube so that the contents, being forced by the vermicular movements of the anterior part, had the greatest difficulty in getting past the constriction. The colt did not show colic nor anything out of the way except an anxious countenance. After lasting several days the loud sounds disappeared and the colt did remarkably well afterward.—(*Veter. Record.*)

CURIOS SYMPTOM OF DISTEMPER [*By the same.*]—Dog suffering with distemper develops paralysis of the lower jaw. This was dropped and unable to close or to remain so even when closed with the hand. The tongue was also paralyzed partially and the dog was unable to drink out of a shallow basin. At times the tongue hung out of the mouth and got dirty looking. The dog manifested also signs of chorea. This symptom has never been noticed before by the writer.—(*Ibidem.*)

CALCULI OF THE BLADDER—CYSTOTOMY—RECOVERY [*Prof. F. Hobday, F. R. C. V. S.*].—Yorkshire female terrier, 5 years old, has been observed since 6 or 7 months, sitting down and micturating frequently; passing at times only a few drops of urine and sometimes there was continuous straining. Rectal examination revealed the presence of calculi in the bladder. Medical

treatment was resorted to for a short while, and finally an operation decided upon. The bitch was put to sleep with a grain of morphia, the site of operation over the distended bladder was shaved and disinfected and the abdomen opened by an incision over the median line in front of the pubic border. The bladder was drawn out, surrounded and protected with sterilized sheeting and wool and opened on the median line by an incision made on a part which was free from blood vessels. Thirty-two calculi of various sizes and forming altogether $1\frac{1}{2}$ ounces in weight were extracted. The bladder was swabbed with chinosol solution and the wound closed with a double row of silk sutures. That of the abdominal walls, muscles also, and the external skin with silkworm gut. The whole was coated with iodoformed collodion. The recovery was quite uneventful.—(*Veterin. Journ.*)

CASE OF ORCHITIS IN A DOG [*A. Heinemann*].—Eleven-year-old dog has been in good health up to a year ago. With age he has lost his teeth; those that remain are in bad condition, his general health has suffered, and he is more or less emaciated. About four months ago one of his testicles began to enlarge and soon rapidly increased to an enormous size. The spermatic cord is thick and edematous. The other testicle seems atrophied. Under morphia and after strict antiseptic precautions, the dog was castrated. The wound healed by first intention. Good treatment to the teeth and peculiar diet made the dog improve rapidly.—(*Ibidem.*)

HEMATOMA OF THE SUBMAXILLARY REGION OF A BULLOCK [*A. D. Macgregor*].—Four months bullock has a swelling above the angle of the jaw on the right side. It burst. Nearly a month later he had another, similar to the first and on the same spot. It grew larger and a blister was applied. The next day there was dyspnea, and great slobbering. The jaws were closed tight and for several days the animal took no food or drink. The swelling burst of itself again. No pus escaped. Three days after the bull died. At the post mortem a tumor was found on the right side under the hyoid. It was encapsulated and pronounced by Prof. Woolridge a hematoma, consisting of firm layers of fibrin round the outside and more recent looking clots in the middle, separated by fine layers of fibrin similar to those in the peripheral portion.—(*Veterin. Journ.*)

SCLEROSTOMA TETRACANTHUM [A Country Practitioner].—These cases occurred in animals belonging to the same farmer and were out of the same mare. They were kept on pastures rather bare. When the worms are first noticed in the faces the animals were not in very bad condition, but they soon showed the bad effects of the presence of the parasites and had to be placed under treatment, namely, better feeding and various vermicides—turpentine, iron, assafoetida, thymol, antimony, etc. The youngest of the three animals improved and recovered. The other two became so weak that they had to be put in slings. One had a complication of troublesome paraphymosis; his lungs became œdematosus and he died. The last one lived one week longer. At the autopsy of the two an abundant fluid collection was found in the peritoneal cavity. The intestinal walls were much thickened. The mucous membrane was covered with small black or greyish black particles which were no doubt the encysted embryos of sclerostoma tetracanthum; yet there was no sclerostomes found in the lumen of the bowel, although within a few days of death, large number of worms had been passed. *Tenia perfoliata* were also found in the intestines.—(*Ibidem.*)

TWO CASES OF PAPILLOMA OF THE PENIS IN HORSES [Prof. G. H. Woolridge, F. R. C. V. S.].—Blue-roan gelding has a large tumor hanging from the prepuce. It is of the cauliflower type. On operating it was found affecting the glans penis and free end of the urethra and sending dense strands into the body of the penis. The operation was carried out by “making a circular incision down to the urethra and about an inch of urethra left protruding. A V-shaped slit was then made longitudinally along the lower margin of the urethra, by means of the hot iron extending to the cut accelerator urinæ muscle.” The tape ligature and the catheter that had been applied at the beginning of the operation were removed and the animal allowed to rise. He did well for six weeks, when he again manifested urinary trouble. This was found to be due to a fibrinous lymph-like substance which was plugging the urethra. It was removed and the horse has done well since. The growth was a papilloma. In the second case, the glans only was involved and the urethra was free. Excision was simple. The nature of the growth was that of a non-malignant papilloma, according to Sir John McFadyean, who made the examination.—(*Veterin. Journ.*)

FRENCH REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

PROLAPSUS RECTI IN A MULE—AMPUTATION—RECOVERY [*Mr. A. Castelet, Army Veterinarian*].—A three-year-old male mule has a tumor under the tail. It is quite large, bosselated, blackish and has the aspect of a polypous growth of large size. It is as big as a child's head and from the center, by violent explosive efforts, small balls of faeces are expelled. It is a prolapsus of the rectum which, it is said, has appeared some days ago, has been first treated by daily lotions of oil, then by an empiric who scarified it in several places with a sharp heated instrument. Finally the owner brought the mule to the writer. Amputation was decided upon and performed by the "Degive's method" as follows: In the first step, two strong No. 5 catgut threads were applied crossway through the prolapsed rectum and close to the anal orifice. In the second step, all the protruding part of the intestine was excised, one centimeter back of the threads crossing each other. As the hemorrhage was abundant, washing with oxygenated water was resorted to. In the third step the threads were cut at the point where they crossed each other and their ends brought together and secured by a single knot. Between these four sutures, others were then introduced to complete the reunion of the parts. There were eight stitches in all. To overcome the effects of the efforts that the mule continued to make, the operation was completed with a purse suture of the anal orifice. The animal was then taken home, and as nothing more was heard about him, the author supposes that he got well.—(*Progrès Vétérinaire*.)

INTER-ARTICULAR LONGITUDINAL FRACTURE OF THE INFERIOR EXTREMITY OF THE FEMUR IN A HORSE [*Mr. L. Auger*].—Aged half thoroughbred mare, while in light harness, runs away. She knocks heavily the hind quarters on the angle of a wall and stops suddenly very lame. Her countenance expresses great pain; the left hind leg is half flexed, scarcely touching the ground with the toe of her foot. The stifle region is the seat of a contused wound, very painful. There is an abnormal mobility and no fracture of the patella can be detected. Alternate movements of abduction and adduction reveal nothing, but in

carrying slowly the leg forwards and backwards a slight crepitation is heard and specially by listening with the ear close to the joint. A diagnosis of inter-articular fracture was made and the animal destroyed.

Post mortem: Hemarthrosis of the whole femoro-tibio-patellar joint and longitudinal fracture of the lower extremity of the femur were found. The internal condyle and the internal border of the trochlea of the femur form a single piece entirely separated from the bone. The tract of the fracture runs in the groove that separates the borders of the trochlea, is continued on the internal border of the inter-condyloid fossa and then runs upwards and inwards to reach the sus-condyloid crest. The fractured piece was held in contact by the ligaments with the principal part of the femur. The ligaments were not entirely ruptured. The internal meniscus was torn.—(*Journ. de Zootechn.*)

DIFFUSE LINGUAL SARCOMA IN A DOG [*MM. Douville and R. Germain*].—Since ten days this bull dog, aged nine years, has the throat swollen; and notwithstanding astringent lotions the swelling has increased. It is diffuse, rather hard, a little oedematous and painful on pressure. There is no fever, the dog has good appetite, but he salivates abundantly and deglutition is difficult. Except a little redness of the mouth, nothing abnormal is detected in that cavity. A deep abscess forming is suspected and treatment prescribed accordingly. Four days later dysphagia is well marked, the base of the tongue is swollen and the right sub-glossal lymphatic glands are also quite swollen. The dog breathes altogether through the nose and if made to move he roars loudly and is liable to become asphyxiated. The pharynx is very red and the tongue cannot be depressed any more. Deep fine capillary exploring punctures are negative. The removal of the lymphatic gland of the right side is decided so as to make an histological diagnosis. The dog dies during the operation.

Post mortem: The tongue, pharynx, larynx, and trachea were removed as a whole piece. The base of the tongue is much swollen, its superior face is rough and ulcerated; the epiglottis is pushed back and nearly closes entirely the entrance of the larynx; a sagittal section of the tongue and larynx shows that in the posterior half of the tongue, the muscles have disappeared and are replaced by a firm, rosy greyish neoplasm having in its middle a necrotic irregular nucleus. The histological examination reveals its nature. It is a globo-cellular sarcoma with small cells.

The lymphatic glands were also diseased.—(*Revue de Medec. Veterin.*)

PERINEAL HERNIA—COLOPEXY—RESECTION OF THE HERNIAL SAC—RECOVERY [Mr. Dieulouard—4th year student].—Seven months ago this Russian greyhound, as result of efforts accompanying obstinate constipation, had, a little to the right of the perineum, a tumor which has grown slowly and now has all the characteristics of a perineal hernia. It is as big as a man's fist, hemispherical, painful to the touch, and irreducible. The animal has lost some of his appetite, and is making constant violent efforts to defecate. Rectal digital examination confirms the diagnosis. An operation is indicated, viz: laparotomy on the left flank to draw the rectum back to its place, colopexy to fix it on the abdominal wall and then dissection of the hernial sac, free from its contents. Under general anesthesia and with all the necessary precautions for thorough disinfection, the laparotomy was performed, the rectum carefully pulled back into its normal position and its anterior portion secured to the abdominal wall on the edges of the wound of operation, with five stitches. The skin of the perineal region was then thoroughly disinfected, the hernial sac dissected, secured with forceps and twisted upon itself so as to close its cavity. A double thread was passed through the peduncle thus formed, these were ligated and the protruding part excised. The outside wound was closed with sutures. Recovery was without event.—(*Rec. de. Medec. Veteri.*)

EMPYEMA IN A MARE AFFECTED WITH PLEURISY [Mr. Floriot, Army Veterinarian].—This operation is commonly performed in man. Classical works record the recovery of a perforating wound of the chest. Similar recoveries are also recorded in the *Journal of Military Hygiene and Medicine*; and in 1895 the first case of pleurotomy is described as performed in an animal suffering with double pleurisy, scro-bloody on the right side, and purulent on the left, where the animal recovered. The following is only an attempt, but deserves notice.

Thoroughbred mare of 4 years has pleuro-pneumonia complicating an attack of strangles. Thoracenthesis was performed on the right side one morning and six liters of liquid extracted. Two other punctures were performed about three days apart. At the fourth operation eight liters of creamy pus were taken off; three days after six of pus on the right and eight of citrine serosity on

the left. Then pleurotomy and washing of the pleura are performed. One incision of the chest being made in the seventh intercostal space. After cleaning with boiled water, a drain was introduced and secured. Notwithstanding minute care, the mare died after a month of illness. The right pleural sac was forming a large abscess. There were also others of smaller sizes in the lungs, the mediastine and the lymphatic glands. The mare could not get well, but the operation gave her a prolongation of life of several weeks.—(*Rev. Gener. de Medec. Veter.*)

CHYLIFORM ASCITIS IN CATS [*Prof. Suffran.*]—Chylous, chyliform or milky ascitis, namely the effusion in the peritoneum of fluid which has the appearance of milk, has been observed in man, but never in domestic animals except cats, and even in those very seldom. The author records another case, that of a very old cat, that has never been ill and which has stopped eating, drinks with avidity and remains always lying down in a corner of the room. His abdomen is enormous, hanging down, is projecting on each side of the body and almost touches the ground when the cat is standing. Succession reveals the pathognomonic sensation of fluctuation in the abdomen. The cat is very thin, his respiration slow and the pulse almost imperceptible. Examination of the abdomen reveals a largely hypertrophied liver, hard, and a little painful on pressure. Puncture of the abdomen, made in two places, gives escape to fluid of ascitis, thick, opalescent, of white bluish color which coagulates after several hours. The animal considered as incurable is placed on observation and dies after a few days. At the autopsy, the peri and intra lobular cirrhosis of the liver was made out by microscopical examination of various sections of the diseased organ. All the other organs were healthy.—(*Rev. Veterin.*)

ANTE PARTUM LAMINITIS [*Mr. Bedel*].—This manifestation, says the author, is not mentioned in classical works on Obstetrics. He has observed one case in 1901 and recorded it and he knows of two others which occurred in the practice of some confrères. This case took place on a primipara cow due to calve, but was six days beyond her term. She was suddenly taken with eclamptic manifestations and when the attack had subsided, the four feet, specially the hind ones, were warm, painful to percussion and it was with great difficulty and severe punishment that the cow was made to move. Directions for the treatment of

laminitis were left. The next day the cow had another attack of eclampsia, but the condition of her feet remained the same. Treatment was continued. The following day she calved after having had another attack one hour before delivery. The animal moved easier, the feet are not hot, and two days after calving all the bad signs had disappeared. She had no nervous spell since.—(*Prog. Vet.*)

ITALIAN REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

PAPILLIFORM ADENOCARCINOMA OF THE PROSTATE WITH METASTATIC EXTENSION [*Doct. Nello Mori*].—A Danish dog of 8 years was supposed to be ailing with gastro-enteritis when the writer was called to see him. He found the dog suffering with what he thought gastro-enteritic catarrh and prescribed a treatment which he expected would relieve him. After some time the doctor was called again as the dog refused all his food and passed no faeces. At that visit, in feeling the condition of the abdomen, a cylindroid body was detected towards the pelvic cavity and as the animal manifested pain with a tendency to bite, constipation was suspected and relieved by castor oil and calomel. But the condition grew worse. There was great emaciation, the dog remained lying stretched on the ground, the respiration was irregular, the prepuce became swollen, and the temperature arose to 39° C. On feeling the abdomen, instead of the cylindroid body detected a few days previous, two masses as big as a large nut were felt in the sub-lumbar region. Auscultation and percussion gave nothing positive and yet were not normal. The urine was very albuminous. Generalized tuberculosis was suspected. Death occurred a few days later.

Post mortem: Stomach was a little distended. Liver almost normal. Spleen has on its apex a bloody tumor, and in its structure numerous small whitish nodules. Kidneys and supra-renal capsules did not seem altered. The prostate presents a tumor as large as the fist, rather hard, cerebroid in aspect. The scrotum was infiltrated with serosity. One of the testicles has nodules

similar to those of the spleen. In the sub-lumbar region two lymphatic glands are hypertrophied. The lungs were bosselated on their surface and contained abundance of roundish tumors, whitish, smooth on section, of cerebroid aspect, and of various sizes. The other organs appeared healthy. The histological examination of the tumors, which was made, revealed their carcinomatous nature. They undoubtedly originated in the prostate and developed by metastasis all over the organism.—(*La Clin. Veterinaria.*)

UPON SEVEN CASES OF PRIMITIVE NEOPLASM OF THE THYROID GLAND IN THE DOG [*Gerardi Bussano*].—The reports of the neoplasms of the thyroid body in dogs are rare. They are more frequent in other animals, in horses, bovines, pigs and cats. In sheep and goats they are rather limited to a condition of hypertrophy or hyperplasia. The anatomical nature of these neoplasms varies very much and may be fibromas, sarcomas, carcinomas, etc., etc. They may exist simple or be associated. From the recent statistics of Guerrini, carcinomas are met in 22 per cent. of the neoplasms of that organ against sarcomas represented only by a proportion of 2 per cent. Cadiot in his statistics says 45 per cent. for carcinomas and 17.5 per cent. for sarcomas. To furnish an addition to these statistics the writer gives the macroscopic and microscopic examinations of seven cases which he has observed and studied himself, and he has found among them one case of epithelioma, one of scuirrhous carcinoma, two of mixomatode carcinoma, two of parvoglobicellular sarcoma and one of colloid carcinoma.—(*La Clin. Veterinaria.*)

SOME ABNORMALIES OF THE BILIARY BLADDER OBSERVED IN ANIMALS [*Doct. Raffaele Pietro Rossi*].—As adjunct director to the public market of Modena, the author has made a number of observations which he has thought worthy of record, as indeed any similar ones ought to be reported whenever found. Their being noticed can be but advantageous and instructive to all. He first recalls those of Huschke, Owen, Gohler, Joly and Lavocat, of Muller and Lancillotti, which all refer to different abnormalities observed in cattle, giraffe, pig, cat and calf and then mentioned those that he has himself seen. Among these was the absence of a gall bladder in three calves, one sheep, one steer, one pig and one cow. Then it is one cow which had a gall bladder normal in

size and form, but abnormal in having a duct formed of two branches which united together only after a short run; in one pig there was a true receptacle for the bile, but there were three subdivided branches to it, which after a certain length in their course united into one single canal; in a pig the gall bladder was divided by a longitudinal fissure into two sacs which united together and formed a unique receptacle with a short neck; in a calf the gall bladder was separated externally by a longitudinal groove, but this separation did not exist in the internal surface; in a cow the bladder was normal, but seemed to form one mass with the hepatic parenchym; in another cow there were two sacs in shape of pears, separated and emptying into one single common hepatic duct; in a calf there were two distinct bladders, each one having a special duct. These ducts united and formed a single hepatic canal. In a pig there were found two gall bladders continued by two canals which open separately, one two centimeters from the pylorus and the other some ten centimeters further, near the insertion of Wirsung's canal.—(*Il Nuovo Ercolani.*)

AMPUTATION OF THE PENIS IN A MULE FOR NEOPLASM OF THE PREPUCE [Dr. Adolfo Luciani].—This is the concise record of a case where the neoplasm, a papilloma, was operated by the author and followed with excellent results. The mule, aged 12 years, had a paraphymosis well marked; with beginning of mortification having taken place here and there. A surgical operation was the only chance of saving the animal. He was well prepared and the region received all aseptic attention. With two incisions the diseased portion of the penis was isolated from the surrounding tissues and after applying a strong ligature above the point where the amputation was to be made, so as to avoid hemorrhage, the diseased and free portion of the glans was cut away carefully saving two or three centimeters of the urethra. This was afterwards divided on the median line and the two flaps secured to the corresponding skin of the penis. Simple disinfecting car was resorted to. A catheter which had been introduced in the urethra was taken out on the fifth day. The only trouble was the presence of large granulations at the entrance of the urethra which interfered some with micturition. But cauterization with nitrate of silver kept them soon under control and the animal was permanently relieved.—(*Il Nuovo Ercolani.*)

GERMAN REVIEW.

By JOHN P. O'LEARY, V. M. D.

A PECULIAR EQUINE INFECTIOUS DISEASE [*Chief Vet. Kra-mell*].—Since the middle of October, 1906, influenza (Brust-seuche) had been prevalent in the regiment, the last case occurring on the 3d of December of that year. On December 30 (same month), the first case of the peculiar disease appeared. The author presents the following summary of the symptomatology of the disease. During five weeks 39 horses out of a stable of 72 were affected with the malady, infection spreading from horse to horse. The incubation stage lasted from one to seven days. Horses which had resisted the epidemic of influenza contracted this disease. The symptoms were as follows: General health slightly or not at all affected; a fever of from one to six days' duration, with a temperature varying from 38.6 to 41° C., which usually rapidly subsided. The course of the disease was irregular; non-febrile intervals occurred frequently. Heart action in some cases normal. In many instances a lowering in frequency to 30 and even to 28 beats with or without a previous elevation of the pulse rate; in a few cases 66 to 70 pulsations were observed. This general circulatory disturbance lasted two to four days; in exceptional cases six days. Pulse regular; in isolated cases irregular and intermittent. Respiration slightly influenced. Conjunctival mucous membrane in most cases normal; at times a slight conjunctivitis present. Appetite in all cases capricious and independent of the fever, this being usually the first remarkable symptom. In about one-third of the cases disturbance in locomotion were present which were manifested by a stiff gait, a string-halt or lameness in one or more feet. In a few cases a slight edematous swelling of the hind legs. Rarely, too, were phlegmonous swellings and edemas observed. The author supposed he had to deal with a hitherto little known infectious disease which belongs to the influenza group.—(*Zeitschrift für Veterinärkunde*, 1908, S. 24.)

COLLARGOL THERAPY IN VETERINARY SURGERY [Dr. Erwin Baum, Deutmannsdorf, Schleisen. From the Surgical Clinic of the Imperial High School, Dresden].—Baum had employed collargol in numerous surgical diseases of the horse and observed

its action closely. He concludes as follows: That collargol is an absolutely non-poisonous, non-irritating remedy in the treatment of wounds. That it prevents pus formation and renders indolent neurotic wound surfaces clean and healthy. To combat suppuration we may use solutions 1 per cent, dusting powder 3 parts collargol to 97 sugar of milk in tablets 0.05 grm. If the solution is used a 1 per cent. dilution is admissible. Collargol produces a granulation formation; for this purpose the dusting powder is to be preferred. Granulation excrescences which require the application of an escharotic for removal do not appear when collargol has been employed. In unhealthy wounds the author recommends beside the local application, the intravenous administration of the remedy. The latter application is further indicated in phlegmonous conditions. Apart from the lowering of the temperature and disappearance of the inflammation, collargol acts as a tonic and improves the general health of the animal. In continued use of the remedy the organism becomes accustomed to its action; so that a change in the medicinal agents is necessary. As collargol is rather expensive, Baum advises to work with the dusting powder and the solution.—(*Berliner Tier Wochenschrift*, No. 25, 1909).

EXAMINATION OF THE DANDRUFF OBTAINED FROM THE SKIN OF THE HORSE [Chimera].—Chimera examined the dandruff which he collected by cleaning horses, and found the following results: 1. The dandruff obtained from well-nourished and thoroughly-groomed horses contained 586,000 to 1,826,000 micro-organisms (*Bacillus subtilis*, *sarcina lutea*, *sarcina aurantiaca*, *Staphylococcus pyogenes aureus*, *Penicillium glaucum*, *Proteus vulg.*, *Aspergillus glaucus*, *Aspergillus flavus*. 2. The dandruff collected from poorly-nourished horses contained 7,656,000 to 24,478,000 bacteria (*Bac. mycoides*, *Staphylococcus pyogenes aureus*, *Staph. citreus*, *Streptococcus pyogenes*, *Sarcina lutea*, *Sarcina alba*, *Sarcina aurantiaca*, *Bacterium coli*, *Aspergillus glaucus*).

3. The dandruff was composed of (a) dead epithelium, dried perspiration, sebaceous matter, whole and broken hairs; (b) organic and inorganic particles from the air and soil; (c) saprophytic and pathogenic bacteria. In consideration of the composition of the dandruff, Chimera perceives in the same a danger, not only for the horse which might easily suffer infections, but also for man who inhales the dandruff, together with portions of hair.

Chimera advises that the cleansing of horses should take place in the open air and the dandruff collected into vessels and rendered harmless by disinfecting fluids.—(D. T. W. No. 12, 1909.)

CONCERNING THE LENGTH OF TIME ALIMENTS REMAIN IN THE INTESTINAL CANAL OF THE HORSE [Cugnini].—Cugnini's investigations were directed to determine the length of time food-stuffs remained in the intestinal canal of the horse. He employed eleven (11) horses for the purpose; the functions of their digestive organs being normal. The daily rations for each horse consisted of 8 to 12 kg. of hay, 0.5 kg. bran and 2 liters of oats, to which was added 200 gm. of powdered Brazil nut, three such doses being given, this agent being easily recognized in the faeces. The first trace of the powdered Brazil nut appeared in the dejections 15 $\frac{1}{4}$ to 20 hours after being administered. The last trace passed in the faeces of some of the animals was 3 days and 2 hours; in other cases 8 days and 3 hours.—(D. T. W. No. 27.)

WHEN a woman nags she is merely canvassing for a man to swear.—*Bit and Spur.*

A TOURIST, hiring a jaunting-car, drove from North Wall to the Metropole Hotel, in Dublin, and tendered the driver a shilling.

“What's this, sorr?” asked the man.

“Your fare,” replied the tourist.

“Hould it a minute while I get my rug down.”

“What do you want your rug for?”

“Well, yer Honor, I want to cover up the poor horse's head. If he sees that fare he will never draw the car again, sorr.”

Boy (to farmer going to market): “Plaze, sur, can ye give I a job?”

Farmer: “Have you got a character?”

Boy: “No; but I can get 'e one.”

Farmer: “Well, meet me here to-night, and if your character is satisfactory I will give you a job.”

Farmer (meeting boy at night): “Well, boy, have you got that character?”

Boy: “No, but I got yourn, and I baint commin'.”

SOCIETY MEETINGS.

ILLINOIS STATE VETERINARY MEDICAL ASSOCIATION.

The twenty-seventh semi-annual meeting was held at the Illinois Hotel, Bloomington, Ill., July 13, 1909. The meeting was called to order at 9.30 a. m. by the president, Dr. N. I. Stringer; fifty veterinarians being present.

Proceedings of the December meeting were read and approved. Drs. W. H. Welch, M. L. Hynes and J. F. Gillespie were appointed Censors *pro tem.*

Program:—Fistulous Withers, by Dr. B. F. Riceberger, was short and to the point, and was discussed by Drs. S. S. Baker, W. J. Martin, Tiffany, Heyworth, Pressler, Mills and Welch.

An interesting Case Report by Dr. N. I. Stringer, a supposed case of Calculus of the Bladder: On operation it proved to be a corn cob between six and seven inches long; a number of the veterinarians present related numerous similar instances that had occurred in their experience.

Dr. Heyworth presented a large tumor taken from a mule a few months after castration; it resembled a large-sized cocoanut covered with a tense fibrous membrane, and on incision it was filled with a semi-solid substance resembling jelly. Dr. A. H. Baker secured the specimen for examination and we await his report.

Dr. C. N. Way presented a paper entitled Dairy Sanitation, Its Importance and Economic Value. He spoke from notes and the matter presented was listened to very attentively and it covered in a brief manner the various phases of dairy sanitation. This paper was discussed quite freely by Drs. Merillat, Martin, Mills, Stringer, Tiffany and A. H. Baker.

Dr. W. H. Welch presented a paper on Orchitis; this was a very interesting paper and brought out a very animated discussion which was indulged in by Drs. Tiffany, Mills, Merillat, Martin and Pressler.

REPORTS OF COMMITTEES: Legislative Committee—Dr. L. A. Merillat, chairman, reported that a new department had been

added to the State Board of Agriculture for the purpose of producing serum for the prevention of Hog Cholera and to furnish the same to persons who are interested in hog raising free of charge.

A law has been placed on the statute books providing for the registration of all stallions, and requires that they have a certificate of health and soundness. The general sanitary laws have been amended, giving the State Veterinarian greater power; also the Governor can issue a proclamation of quarantine against live stock in a district as required. The bill for State meat inspection failed to pass, as did also the bill for tuberculin test.

The petitions of ten applicants for membership were presented and were referred to the Board of Censors; the report being favorable, on motion the secretary was instructed to cast the ballot, the ballot being cast they were declared duly elected.

Dr. A. H. Baker then gave those present a short talk on the coming meeting of the A. V. M. A. to be held in Chicago September 7 to 10, and urged a large attendance.

The resignation of Dr. J. J. Millar was presented and on motion was accepted.

A number of illegal practitioners was reported and a general discussion followed. The meeting then adjourned to meet in Chicago December 1 and 2, 1909.

J. H. CRAWFORD,
Secretary.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

The regular meeting was held in the lecture room of the New York-American Veterinary College, 141 West Fifty-fourth street, on Wednesday evening, October 6, with the president, Dr. F. C. Grenside, in the chair. After the minutes of the previous meeting were read and approved the president spoke of the loss, by death, of two prominent members of the veterinary profession, Dr. Leonard Pearson, of Philadelphia, Pa., and Dr. D. J. Dixon, of Hoboken, N. J., both of whom were members of our association.

Dr. Pearson was an honorary member, and had always taken a great interest in our association. Dr. Dixon was a very regu-

lar attendant at our meetings and always took an active part in the discussions.

The president asked Drs. Gill, Ackerman and Sherwood to serve as a committee in drafting and presenting suitable resolutions on the death of Dr. Pearson.

Drs. Robertson, Ellis and Ryder were asked to serve in a similar capacity in presenting resolutions on the death of Dr. Dixon.

The members discussed the advisability of holding another reunion and smoker during the early winter. Last year's smoker was such an enjoyable affair that it seemed to be the opinion of all that another should be held this year. It was decided to hold the smoker this year in connection with the annual meeting on Wednesday evening, December 1. The committee in charge of this affair consists of Drs. Mangan, Grenside and Clayton.

The program for the evening consisted of reports from the delegates to the New York State Veterinary Society's meeting, held at Ithaca, N. Y., and reports from the delegates in attendance at the American Veterinary Medical Association meeting held at Chicago. Drs. Cochran and Grenside gave interesting accounts of the leading features of the very successful meeting of the State Society.

Drs. McKinney, Ellis and Cochran reported on the A. V. M. A. meeting in an interesting manner. All spoke of the excellence of the literary program. The clinic was also greatly appreciated.

An interesting discussion followed the reports of the delegates.

For the November meeting Dr. R. H. Kingston will present a paper on "Protargol and Its Uses." Dr. C. N. Darke will present some case reports.

W. REID BLAIR,
Secretary.

MASSACHUSETTS VETERINARY ASSOCIATION.

The regular monthly meeting was held Wednesday evening, September 29, at Young's Hotel, Boston.

As often happens the first fall meeting had but a light attendance, which seems a pity, for it is the best opportunity for

the members who are interested in the doings of the A. V. M. A. for getting the news of the latter while it is still fresh from those lucky enough to have gone to the National.

Dr. Winchester called the attention of the members present to the loss which the profession has sustained in the death of Dr. Leonard Pearson. It was voted to pass resolutions on the matter and to send a copy to the family as well as to spread the same upon the records of our association.

It was also voted to take similar steps regarding the deaths of two of the association's members who have recently died, namely, Dr. E. C. Beckett, late of Boston, and Dr. R. J. Marshall, of Williamstown, Mass. Dr. Beckett's death ended an illness of over two years' standing.

Dr. Winchester spoke of the sad accident which happened to U. S. Meat Inspector, Dr. Daniel Hayes, of Waltham, who was terribly injured by an insane workman at one of the slaughtering plants near Boston some months ago while the doctor was on duty.

As a result of Dr. Winchester's remarks a committee of two were appointed to collect the facts in the case and later place them before the association, there to vote their course.

Wm. T. WHITE,
Secretary.

DR. R. T. WHITTLESEY recently performed a delicate operation in the domain of gynecology, on a valuable lioness. Four ounces of chloroform caused complete anæsthesia. A complete account of the case from Dr. Whittlesey would make interesting reading, and we trust he will furnish us with it.

PRESIDENT HOLLINGWORTH, of the New York State Veterinary Medical Society, has added two committees to those already appointed by him, as follows: Committee on Therapeutics, H. J. Milks, chairman; H. D. Hanson and R. N. Gordon Darby. Committee on Diseases, Geo. H. Berns, chairman; L. G. Moore and W. L. Baker. With eight committees previously appointed, the outlook for the coming year is certainly good, and much should be accomplished by that organization under the direction of its enthusiastic and loyal executive.

NEWS AND ITEMS.

Dr. E. R. FORBES (O. V. C., 1883) has been appointed State Veterinarian of Texas.

THE address of Dr. R. P. Lyman, secretary of the A. V. M. A. is No. 1336 East Fifteenth street, Kansas City, Mo.

DR J. E. BARD, of Niles, Ohio, has been transferred to Manila, P. I., where he is in the Bureau of Agriculture.

F. W. CHAMBERLAIN, B. S., D. V. M., Burlington, Vt., has accepted the position of Associate Professor of Veterinary Science, in the College of Agriculture, Moscow, Idaho. His many friends wish him success in his new field.

DR. DOUGHERTY, of Baltimore, opened champagne on the occasion of the A. V. M. A. banquet at Chicago, to drink the health of Prof. Liautard; and those who were fortunate enough to be at his table were asked to join him in "a toast to Liautard." Happily, with one or two exceptions, they were all "his boys."

DR. GEORGE S. JORDAN, class of 1909, Ohio State Veterinary College, and Miss Mary L. Covil, of Springfield, Mass., were united in marriage October 6, 1909, at the home of the bride. Dr. and Mrs. Jordan will reside in Malden, Mass., where the Doctor has a position as assistant to Dr. W. M. Simpson.

DR. H. S. MURPHY is lecturing on physiology, meat inspection and sanitary science at the Iowa State College, Ames. Dr. Murphy graduated from the Veterinary Department of Ohio State University in 1908.

Dr. W. W. Dimmock, graduate of Connecticut Agricultural College, 1901, and New York State Veterinary College, 1905, teaches pathology in the same institution. Dr. Dimmock was formerly connected with the Experiment Station and subsequently with the Sanitary Commission, of Cuba.

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary.
Alumni Ass'n, N. Y.-A. V. C.	.....	141 W. 54th St.	L. L. Glynn, N. Y. City.
American V. M. Ass'n.....	.....	Chicago.....	R. P. Lyman, Kansas City, Mo.
Arkansas Veterinary Ass'n.....	.....	Lec. Room, La- val Un'y, Mon.	Horace E. Rice, Little Rock.
Ass'n Médécale Veterinaire Fran- çaise "Laval".....	1st and 3d Thur. of each month	Chicago.....	J. P. A. Houde, Montreal.
B. A. I. Vet. In. A., Chicago.....	2d Fri. ea. mo.	San Francisco.	D. D. Tierney, Chicago, Ill.
California State V. M. Ass'n.....	.....	Ottawa.....	J. J. Hogarty, Oakland.
Central Canada V. Ass'n.....	.....	Chicago.....	A. E. James, Ottawa.
Chicago Veterinary Society.....	.....	Denver.....	J. M. Parks, Chicago.
Colorado State V. M. Ass'n.....	.....	New Haven.....	M. J. Woodliffe, Denver.
Connecticut V. M. Ass'n.....	.....	Rochester.....	B. K. Dow, Willimantic.
Genesee Valley V. M. Ass'n.....	2d wk. in Jan., '10.	Athens.....	J. H. Taylor, Henrietta.
Georgia State V. M. A.....	Nov. 16-17, 1909.	Chicago.....	P. F. Bahnsen, Americus.
Hamilton Co. (Ohio) V. A.....	Dec. 1-2, 1909.	Louisville.....	Louis P. Cook, Cincinnati.
Illinois State V. M. Ass'n.....	Jan. and Aug.	Indianapolis.....	J. H. Crawford, Harvard.
Illinois V. M. and Surg. A.....	January, 1910.	Ft. Dodge.....	W. A. Swain, Mt. Pulaski.
Indiana Veterinary Association.....	.....	Manhattan.....	E. M. Bronson, Indianapolis.
Iowa Veterinary Ass'n.....	Jan. 4-5, 1910.	Not decided.....	H. C. Simpson, Denison.
Kansas State V. M. Ass'n.....	.....	Philadelphia.....	B. Rogers, Manhattan.
Kentuck V. M. Ass'n.....	Monthly.....	Waterville.....	D. A. Piatt, Lexington.
Keystone V. M. Ass'n.....	.....	Baltimore.....	S. Lockett, Glenolden.
Louisiana State V. M. Ass'n.....	.....	Boston.....	E. P. Flower, Baton Rouge.
Maine Vet. Med. Ass'n.....	.....	Saginaw.....	A. Joly, Waterville.
Maryland State Vet. Society.....	.....	Stillwater.....	H. H. Counselman, Sec'y.
Massachusetts Vet. Ass'n.....	.....	Kansas City.....	Wm. T. White, Newtonville.
Michigan State V. M. Ass'n.....	.....	St. Joseph.....	Judson Black, Richmond.
Minnesota State V. M. Ass'n.....	.....	Helena.....	G. Ed. Leech, Winona.
Mississippi State V. M. Ass'n.....	.....	Grand Island.....	J. C. Robert, Agricultural Col.
Missouri Valley V. Ass'n.....	.....	Ithaca.....	B. F. Kaupp, Fort Collins, Colo.
Missouri Vet. Med. Ass'n.....	.....	Wilmington.....	F. F. Brown, Kansas City.
Montana State V. M. A.....	.....	Fargo.....	W. S. Swank, Miles City.
Nebraska V. M. Ass'n.....	.....	Columbus.....	H. Jensen, Weeping Water.
New York S. V. M. Soc'y.....	.....	Up'r Sandusky.....	J. F. De Vine, Goshen.
North Carolina V. M. Ass'n.....	.....	Paterson, N. J.....	Adam Fisher, Charlotte.
North Dakota V. M. Ass'n.....	.....	Philadelphia.....	C. H. Martin, Valley City.
Ohio State V. M. Ass'n.....	.....	Mon. and Que. Providence.....	Sidney D. Myers, Wilmington.
Ohio Soc. of Comparative Med.	Call of Sec'y.....	St. Louis.....	F. F. Sheets, Van Wert, Ohio.
Oklahoma V. M. Ass'n.....	Annually.....	Reading.....	W. H. Martin, El Reno.
Ontario Vet. Ass'n.....	.....	Philadelphia.....	C. H. Sweetapple, Toronto.
Passaic Co. V. M. Ass'n.....	Call of Chair.....	Sioux Falls.....	H. K. Berry, Paterson, N. J.
Pennsylvania State V. M. A.....	.....	Los Angeles.....	F. H. Schneider, Philadelphia.
Philippine V. M. A.....	.....	407 Ill. Ave.....	Chas. G. Thomson, Manila.
Province of Quebec V. M. A.....	.....	Murfreesboro.....	Gustave Boyer, Rigaud, P. Q.
Rhode Island V. M. Ass'n.....	.....	St. P. Minneap. White Riv. Jc.	J. S. Pollard, Providence.
St. Louis Soc. of Vet. Inspectors.....	.....	.....	Wm. T. Conway, St. Louis, Mo.
Schuylkill Valley V. M. A.....	.....	.....	W. G. Huyett, Wernersville.
Soc. Vet. Alumni Univ. Penn.....	.....	.....	B. T. Woodward, Wash'n, D. C.
South Dakota V. M. A.....	.....	.....	J. A. Graham, Sioux Falls.
Southern Auxiliary of California State V. M. Ass'n.....	Jan. Apl. Jy. Oct.	.....	J. A. Edmonds, Los Angeles.
So. St. Joseph Ass'n of Vet. Insp. Tennessee Vet. Med. Ass'n.....	4th Tues. ea. mo.	.....	H. R. Collins, So. St. Joseph.
Texas V. M. Ass'n.....	Nov. 18, 1909.	.....	A. C. Topmiller, Murfreesboro.
Twin City V. M. Ass'n.....	Call Exec. Com.	.....	R. P. Marsteller, College Sta.
Vermont Vet. Med. Ass'n.....	2d Thu. ea. mo.	.....	S. H. Ward, St. Paul, Minn.
Veterinary Ass'n of Alberta.....	Jan. 19th, 1910.	.....	F. W. Chamberlain, Burlington.
Vet. Ass'n Dist. of Columbia.....	3d Wed. ea. mo.	.....	C. H. H. Sweetapple, For.
Vet. Ass'n of Manitoba.....	Not stated.....	514-oth St., N. W.....	Saskatchewan, Alta., Can.
Vet. Med. Ass'n of N. J. V. M. Ass'n, New York City.....	Jan. 13, 1910.	Winnipeg.....	M. Page Smith, Wash., D. C.
Veterinary Practitioners' Club.....	1st Wed. ea. mo.	Jersey City.....	F. Torrance, Winnipeg.
Virginia State V. M. Ass'n.....	Monthly	141 W. 54th St.	W. Herbert Lowe, Paterson.
Washington State Col. V. M. A.....	.....	Jersey City.....	W. Reid Blair, N. Y. City.
Washington State V. M. A.....	1st & 3d Fri. Eve.	Hampton.....	A. F. Mount, Jersey City.
Western Penn. V. M. Ass'n.....	.....	Pullman.....	W. G. Chrisman, Charlo'sv'lle.
Wisconsin Soc. Vet. Grad.....	1st Wed. ea. mo.	Seattle.....	R. G. McAlister, Pullman.
York Co. (Pa.) V. M. A.....	Dec. 7, 1909.	Pittsburgh.....	J. T. Seely, Seattle.
		Grand Rapids.....	F. Weitzell, Allegheny.
		York, Pa.....	J. P. West, Madison.
			E. S. Bausticker, York, Pa.

PUBLISHERS' DEPARTMENT.

Subscription price, \$3 per annum, invariably in advance; Canadian subscriptions, \$3.25; foreign countries, \$3.00; students while attending college, \$2; Students in Canada, \$2.25; single copies, 25 cents.

Rejected manuscripts will not be returned unless postage is forwarded.

Subscribers are earnestly requested to notify the Business Manager immediately upon changing their address. Make all checks or P. O. orders payable to American Veterinary Review.

IF any REVIEW reader should chance to meet Dr. James Shannon, whose address on the REVIEW books is "Care of City Milk Inspector, Topeka, Kansas," where his REVIEWS were received by him up to and including the July number, and will call his attention to this paragraph, they will confer a favor upon the Publishers. August number was sent as usual, when Post Master sent a card to the effect, "Number unclaimed." Postage was sent for said number. We then received a letter from Dr. Shannon, from Topeka, inquiring why he did not get his REVIEW, as all the other veterinarians around there had theirs. We thought the Post Master had been lax, and sent another August number; and received another card "Unclaimed." We sent postage a second time and obtained the number, and addressed a letter to Dr. Shannon, enclosing the Post Master's notices in explanation; and that letter has been returned stamped "Gone; no order." In the meantime Dr. Shannon has continued to write for his numbers and we have continued to send them, and letters of explanation, but first-class mail has been returned, and we have been asked to send postage for the second-class matter, which we have done. We find it impossible to reach him by mail in explanation of the situation, and hope some of his friends who are receiving their numbers regularly will call his attention to this explanation.

"A MANUAL OF POISONOUS PLANTS," which is the title of a work by Prof. L. H. PAMMEL, Ph.D., that was advertised on the page opposite in the October number, has been transferred to page 30, where more space was available in which to describe it. This book, which will be ready in January, coming as it does from the pen of Dr. Pammel, who is Professor of Morphology, Physiology and Systematic Botany at the Iowa State College of Agriculture, should be a valuable addition to every veterinarian's library. Prof. Pammel asks that you write for sample pages.

ACCURACY IN VETERINARY THERAPEUTICS—PARKE, DAVIS AND COMPANY.
Same thing.

